

S. HRG. 117-416

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 2022

HEARINGS BEFORE A SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS UNITED STATES SENATE ONE HUNDRED SEVENTEENTH CONGRESS

FIRST SESSION

ON

H.R. 4432

AN ACT MAKING APPROPRIATIONS FOR THE DEPARTMENT OF DEFENSE
FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 2022, AND FOR
OTHER PURPOSES

**Department of Defense
Nondepartmental Witnesses**

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DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 2022

TUESDAY, APRIL 13, 2021

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 10:02 a.m. in room SD-192, Dirksen Office Building, Hon. Jon Tester (chairman) presiding.

Present: Senators Tester, Durbin, Baldwin, Shaheen, Shelby, Moran, and Hoeven.

DEPARTMENT OF DEFENSE

DEFENSE INNOVATION AND RESEARCH

STATEMENT OF Ms. BARBARA McQUISTON, PERFORMING THE DUTIES OF THE UNDER SECRETARY OF DEFENSE FOR RESEARCH AND ENGINEERING

OPENING STATEMENT OF SENATOR JON TESTER

Senator TESTER. We'll call this committee to order.

I want to start by telling everybody here what an honor it is to serve as chairman of this committee and with Senator Shelby, a true gentleman, and I also want to thank Dick Durbin for his long-time leadership on this committee, something that I have appreciated as a member and I have continued appreciation for his role as Whip and the chairman in the caucus, and so thank you, Senator Durbin.

Today, we have Ms. McQuiston, and Dr. Tompkins virtually. Thank you all for being here today, and I want to thank you for your ongoing hard work to lead and shape the Department of Defense Innovation and Modernization efforts.

When it comes to Federal funding priorities, few things are more important than innovation and research, and it is critical for Congress to continue to make strong research investments across the board.

America is facing many difficult and evolving national security challenges right now. We have heard from combatant commands in recent weeks about the daily threats they face, particularly from Admiral Davidson, the Commander of the Indo-Pacific Command.

In this subcommittee, it is critical that we do our best to ensure our service members continue to have access to the world's most sophisticated and advanced technologies. So I hope to hear the witnesses' perspective on the global race for innovation, particularly as we compete with China and Russia, and I look forward to learning

more about ongoing and future DOD (Department of Defense) technology innovation efforts and whether it has the tools and resources it needs to work with various partners across the country and that includes taking advantage of the incredible innovations happening across this country, including those at small businesses who can often bring fresh ideas, nimble operations, and cutting edge inventions to the table.

With that, I will turn to Ranking Member Shelby for his comments.

Senator Shelby.

STATEMENT OF SENATOR RICHARD C. SHELBY

Senator SHELBY. Thank you, Mr. Chairman. Thank you for this hearing. I think it's very important to have a hearing with DARPA (Defense Advanced Research Projects Agency). Welcome.

This committee has approved billions of dollars, Mr. Chairman, for basic research, applied research, and advanced technology development to support efforts that would allow our military to maintain a competitive advantage and strategic advantage over our adversaries.

Our technological and industrial progress remains a constant target from China and Russia and other nation states that are actively working to undermine and surpass our military's advancements. I believe we need a ready and lethal force equipped with modernized systems capable of providing strong national security and, importantly, deterring war. Our investments in innovative research are critical in guaranteeing success here.

Over the last 4 years, this committee has supported the necessary budget increases in cutting edge research areas, such as hypersonics, artificial intelligence, unmanned systems, and micro-electronics to address warfighter needs and capability gaps, and with the top-line budget recommendations unveiled by the current Administration last week, I'm currently concerned about our ability to continue to make those essential strategic investments that will allow us to keep pace.

I look forward to hearing from the witnesses today about the progress being made in innovation and technology within the Department of Defense and how resource constraints may impact the department's ability to field cutting edge technology in the future.

I also recognize that we're significantly constrained from getting into many of the details here today that would provide for a comprehensive discussion in an open hearing setting.

Perhaps, Mr. Chairman, I've suggested that we consider a classified discussion with DARPA at a later date when you can have it because what DARPA is doing is important to all of us and especially to our Armed Forces.

Thank you, Mr. Chairman.

Senator TESTER. Absolutely, Senator Shelby, and we will take that up. We'll make that happen.

I would recognize Ms. McQuiston for a statement. You have 5 minutes. There is a Memorial Service at 11. So I'd ask you to try to keep your comments to 5 minutes and so we can get some questions. The rest of your statement for sure, your full statement will be a part of the record. So you have the floor.

SUMMARY STATEMENT OF MS. BARBARA MCQUISTON

Ms. MCQUISTON. Chairman Tester, Ranking Member Shelby, and Members of the Subcommittee, thank you for providing this opportunity to testify—

Senator TESTER. You need to turn your mike on, please.

Ms. MCQUISTON. I apologize. Is it on?

Senator TESTER. Bring it closer to your mouth. It might help.

Ms. MCQUISTON. It's not lighting up. Okay. I apologize.

Chairman Tester, Ranking Member Shelby, and Members of the Committee, thank you for providing this opportunity to testify before you today. It's an honor to be here alongside my friend and colleague, Dr. Stefanie Tompkins, Director of DARPA.

I'm truly honored to represent the Research and Engineering Workforce. I'm also excited to return to public service. I began my first government tour in 2006 at DARPA and today I return to public service performing the duties of Under Secretary overseeing DARPA as well as DIU MDA Space Development Agency Service Labs, Direct Prototyping and Experimentation.

R&E serves as the chief technology officer for the Department of Defense, strengthening national security and boosting economic security. Investments in science, technology, and innovation today can pay dividends tomorrow.

When I first started at DARPA, scientists were conducting research in vaccine technology. Today, those discoveries have contributed to the success of the COVID-19 vaccines. I'm quite excited and proud that we are all benefiting from past investments as we address the global pandemic. This is just one example of the tremendous impact DOD investments have not just for our military but for our Nation as a whole.

To continue this track record of success, we must reaffirm our commitment to science, technology, and innovation today to guarantee a strong tomorrow. This strategy for the future is critical because our competitors are moving quickly.

The use of drones in the recent conflict between Azerbaijan and Armenia may foreshadow things to come as others move more quickly to adopt cheap emerging technology.

As both Secretary Austin and Deputy Secretary Hicks have stated, the People's Republic of China is a pacing challenge to the U.S. military. Bringing new technology and innovations will be central to meeting that challenge. Presenting a credible deterrent to potential adversaries requires us to develop and field emerging technologies.

We must innovate at speeds and scale. Success requires more than a go-it-alone approach. We must explore more flexible partnerships with the private sector and academia, with small businesses and HBCUs (Historically Black Colleges and Universities). We must reinvigorate our Federal research capabilities, elevate science, promote technology, and expand partnerships with our allies.

R&E is committed to overcoming the value of death. We've shown that innovation and modernization can be done faster with more flexibility and commercial opportunities. From low-cost expendable drones to safer ion batteries, we must strive to eliminate

gaps in planning or funding that can leave a project sitting on the shelf for years. We must do more to engage the services from day one.

Our competitors and potential adversaries will not wait for our planning and budget cycles. We must balance oversight with the need to move quickly in order to maintain our advantages. This last year has demonstrated the importance of supply chains. The President and Congress have made it clear that onshoring the supply chain for microelectronics is critical to our national and economic security. The department has been taking actions to make microelectronics trustworthy, available, and sustainable.

When I joined the government labs, our labs are the premier place to work. Although we employ some of the best and brightest minds, we are losing talent to the private sector and competitors. The hiring flexibility Congress has recently given to the department are helping, but we need to do more.

One bright spot I want to highlight is DOD Bush Faculty Member John Rogers who pioneered the new field of bioelectronics. Rogers' research was the foundation of a new class of stretchable electronic devices. This research led to the 2020 release of a new flexible skin patch that can track a person's health through sweat. It allows for wearable devices to detect whether someone has COVID-19. His company is award-winning and moving to commercialize the sensors based on this research.

While I'm optimistic about R&E's ability to be successful, we have significant work ahead. Having an under secretary solely focused on innovation could not be more important than it is today.

I look forward to partnering with Congress to advance our mission, to lead in technology dominance across the DOD, and ensure the unquestioned superiority of the Joint Force while strengthening the American economy.

Thank you. And I look forward to your questions.

Senator TESTER. Ms. McQuiston, thank you for your testimony, and there will be questions.

[The statement follows:]

PREPARED STATEMENT OF MS. BARBARA MCQUISTON

Chairman Tester, Ranking Member Shelby and Members of the Subcommittee, thank you for the opportunity to testify before you today. It is an honor to be here alongside my friend and colleague Dr. Stefanie Tompkins, the Director of the Defense Advanced Research Projects Agency, DARPA. And more importantly, I am honored to represent the men and women of the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)). In addition to DARPA, OUSD(R&E) is home to diverse group of engineers, scientists, researchers, and staff officers who work in three separate agencies and in offices, laboratories, and universities across our nation. OUSD(R&E)'s mission is to maintain DoD's technological edge and to lead technological change and innovation throughout the DoD.

In the three years since Congress directed the creation of OUSD(R&E), and gave the office a mandate to advance technology and innovation across the Department, OUSD(R&E) has developed and begun implementing modernization roadmaps in key technology areas. OUSD(R&E) has also strengthened lab and university partnerships for basic research and worked closely with the services to improve prototyping efforts in order to bridge the "valley of death" from prototype to program of record.

Recently, Deputy Secretary Hicks assigned OUSD(R&E) the additional role of chairing a new Innovation Steering Group (ISG). This group will provide OUSD(R&E) with a mechanism for collaborating with leaders across the Department, for synchronizing innovation efforts and sharing lessons learned, and for driv-

ing initiatives to innovate at speed and scale. We convened this group for the first time last week, and the Deputy Secretary will hold her first Defense Management Action Group meeting on the subject of innovation and joint experimentation later this week. By creating the ISG, Sec. Hicks has signaled the importance of innovation and the attention it deserves. Simply put, it is a good time to be an innovator in the Department of Defense.

OUSD(R&E) consists of three core organizations and a number of subordinate agencies and activities. The office of Research and Technology (R&T) is responsible for overseeing DoD's labs, Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Centers (UARCs), academic and basic research, manufacturing institutes, and Small Business Innovation Research (SBIR). R&T's support for basic science provides the fuel that will power DoD's innovation and modernization efforts well into the future.

OUSD(R&E)'s Modernization office (MOD) connects technologies developed in laboratories with future warfighting capabilities. MOD has developed roadmaps for DoD's 11 modernization priorities—that will be addressed later in detail—to guide these key technologies from early-stage science through capability fielding.

The office of Advanced Capabilities (AC) focuses on technology transition. By conducting war games, mission engineering analysis, prototyping, and demonstrations, AC converts technologies into warfighting capabilities and gets those capabilities ready to field.

In addition to these headquarters organizations, OUSD(R&E) also houses the Missile Defense Agency (MDA), the Space Development Agency (SDA), the Defense Innovation Unit (DIU), and DARPA. DIU connects DoD with private sector innovators who use commercial technology to address some of the Department's hardest problems. MDA develops and fields advanced capabilities to defend against rogue regime missile threats. SDA is rapidly developing a new space architecture that is capable of tracking advanced missile threats. Finally, of course, I am honored to have the DARPA director speaking alongside me today.

FACILITATING TRANSITIONS

The “valley of death” is the chasm between a technology and warfighting capability. Countless technologies fail to transition into warfighting capabilities and fall victim to this valley of death. To shepherd new technologies across the valley of death instead, OUSD(R&E)'s Advanced Capabilities (AC) directorate executes nine programs that are dedicated to technology transition. By focusing on different sources of innovation, technology readiness levels (TRLs), and customer groups, these programs form a balanced portfolio that transitions capabilities to the Services, Combatant Commands, or other operational user groups, at an average rate of approximately 80%. This 80% “sweet spot” offers a responsible balance between using taxpayer dollars wisely, while also taking measured risks to maintain DoD's competitive edge.

Transition rate is an important measure of success because the Joint Staff, Services, Combatant Commands, and warfighters will not accept capabilities that do not meet their mission needs. By working closely with these partners early in the prototyping process, AC maximizes its transition rate by ensuring that partners are ready to accept and field new capabilities when prototyping completes. Beginning this year, AC added Mission Engineering to its toolbox; this process rigorously evaluates Joint Staff and Combatant Command priority missions and identifies new opportunities to transition capabilities and deliver even greater impact to the Department.

PROTOTYPING PATHWAYS TO DELIVER INNOVATION TO USERS

Results from OUSD(R&E)'s prototyping programs illustrate how, when combined with experiments and demonstrations, prototyping is an effective tool for bridging the valley of death. For example, the Quick Reaction Special Projects (QRSP) program seeks out prototyping ideas from across the innovation space, including small businesses, non-traditional performers, and academia. By discovering innovative but raw ideas and creating prototyping programs to further their development, QRSP serves as a vehicle for “technology push” and offers the warfighter capabilities that they did not realize were possible.

To ensure that DoD quickly transitions these new capabilities, QRSP awards contracts throughout the budget year of execution. For example, QRSP awarded a contract to the start-up Adronos which enabled it to compete in a “shoot off” demonstration. During this demonstration, Adronos achieved 15% better performance than other solid fuel formulations: a potential game-changer for hypersonics and long-

range precision fires. QRSP's near real-time award enabled this small business to quickly refine their novel fuel and to demonstrate its utility to DoD.

Speed is a critical enabler of technology transition, especially for emerging technologies. For this reason, the Emerging Capabilities Technology Development (ECTD) program identifies promising technologies when they first appear on the horizon. ECTD then quickly assesses the potential utility of these technologies and creates a prototype for a Service partner to rapidly evaluate. For example, in 2017, ECTD initiated a multi-Service project to prototype a cognitive software-defined radar capable of operating in congested and contested electromagnetic environments. In less than three years, the SDRadar prototype transitioned to U.S. Army and U.S. Air Force programs of record.

Finally, OUSD(R&E) maintains low-cost demonstration and experimentation venues to specifically support small business and non-traditional performers. These venues enable DoD to access cutting edge capabilities and ideas from across the innovation base. They also enable small businesses and non-traditional performers to interact with DoD users, to learn about DoD's mission, to gain experience that can be leveraged to meet future DoD needs. Two such venues, Thunderstorm and Stiletto, demonstrated technologies from 60 small businesses in FY20.

TECHNOLOGY TRANSITIONED BY OUSD(R&E) THAT IS MAKING A DIFFERENCE FOR THE WARFIGHTER

Not only do OUSD(R&E)'s prototyping programs enjoy an ~80% transition rate, they also deliver cutting-edge capabilities that make a difference for the warfighter. For example:

- Low Cost "Attritable" Strike Demonstration (LCASD) or XQ-58A Valkyrie, Joint Capability Technology Demonstration (JCTD)*: Facing potential adversaries with increasingly complex air defenses, INDOPACOM issued a call for an ultra-low cost, long-range aircraft to conduct strike or reconnaissance missions. OUSD(R&E) answered the call with the LCASD JCTD. This aircraft, also known as the USAF XQ-58A Valkyrie, allows the United States to avoid placing our pilots and high value aircraft at risk during the early stages of a confrontation. The project also demonstrated agile automated manufacturing processes, gathered performance data (e.g., weight, strength, stiffness), evaluated cost model data (e.g., cost, schedule lead time), and developed in-house prototyping capability for low cost attritable aircraft technology. LCASD also proved that it is possible to rapidly manufacture a low cost, combat relevant aircraft. This accomplishment has tremendous implications for a future fleet of loss tolerant aircraft which could change the nature and conduct of warfare itself. These capabilities transitioned to the USAF Skyborg program and would not have been possible without the strong support of Congress.
- More Situational Awareness for Industrial Control Systems (MOSAICS) Joint Capability Technology Demonstration (JCTD)*: MOSAICS demonstrated a semi-autonomous solution to enhance the cyber defenses of industrial control systems associated with DoD critical infrastructure (e.g., fuel depots and electric grids). MOSAICS provides warfighters with tools to quickly identify, respond, and recover from cyber-enabled attacks on critical power, water, communication, and transportation systems. Naval Facilities Engineering Command is already planning to transition and sustain the first MOSAICS leave-behind prototype at Naval Base San Diego and is evaluating other opportunities to deploy MOSAICS capabilities at facilities in the INDOPACOM area of responsibility. Additionally, the Department is looking to use of MOSAICS to improve the cybersecurity of other critical DoD systems, including offensive cyber, long-range strike, and nuclear deterrent systems.
- Hack-A-Sat*: Borrowing a common practice for testing system security in the commercial sector, the Hack-A-Sat project invited hackers from around the world to attempt to hack actual DoD satellites. By watching the world's best hackers at work, DoD identified new, cutting-edge hacking strategies and is developing new offensive and defensive approaches for space and cyber protection. In Q2FY21, space and cyber experts from across DoD met to apply lessons learned from Hack-A-Sat to develop new concepts for space and cyber operations. I welcome the opportunity to share additional details about this effort in an appropriate setting.

DEFENSE INNOVATION UNIT TRANSITIONS COMMERCIAL TECHNOLOGIES TO THE WARFIGHTER

In addition to prototyping to bridge the valley of death, DoD's investments must cultivate new workforce talent, attract first-time DoD vendors, and identify novel so-

lutions from across the national security innovation base: together, the Defense Innovation Unit (DIU), the National Security Innovation Network (NSIN), and National Security Innovation Capital (NSIC) partner with industry and academia to do just that. As Chinese investments aim to compete with U.S.'s technological lead in key sectors, DoD's investments can play an important role laying the foundation for a successful startup ecosystem and for ensuring national and economic security.

DIU, for example, rapidly prototypes, fields, and scales state-of-the-art commercial solutions. Leveraging the innovation, cost-savings, and economies of scale of the commercial sector, DIU has awarded contracts to 189 unique companies, of which 143 are small businesses and 61 are first-time vendors to DoD. DIU has transitioned 19 solutions to the warfighter, including small drones, automated cyber vulnerability detection and remediation, mobile endpoint security, advanced data management and analytics, air threat response, predictive mission configuration, rapid analysis of threat exposure, and space situational awareness. DIU's predictive maintenance solution scaled from one aircraft to fielding across the Air Force and Army and its small drone solutions scaled from the Army to all levels of the U.S. government. At DIU, there is also an opportunity for larger defense contractors to integrate the innovative commercial technology of smaller firms to provide ready-made solutions to the warfighter.

Like DIU, NSIN works to redefine what national security service means for academics, technologists, and entrepreneurs. NSIN runs problem-solving programs such as Hacking for Defense (H4D) to produce new concepts and capabilities for DoD end users. NSIN also works to commercialize dual-use technology developed at DoD laboratories and to support company formation and the scale-up of dual-use hardware manufacturing capabilities, including those in autonomy, communications, power, sensors, and space. NSIN partners with 66 universities in 46 states and has placed 175 people in DoD STEM positions, of which 47% were women or minorities.

MISSION ENGINEERING

Mission Engineering (ME) is an analytical approach for evaluating potential capabilities in the context of real-world missions and threats. Rigorous and data-driven, ME can help inform DoD's requirements definition and technology investment processes and can support the development of government reference architectures. In December 2020, OUSD(R&E), in collaboration with the Services, Joint Staff and the OSD engineering community, codified the ME process by releasing the first edition of the Mission Engineering Guide. This guide disseminates best practices, invokes critical thinking, and provides a consistent methodology for practitioners to use when performing ME analysis.

In FY21, OUSD(R&E)'s Mission Engineering team initiated four analyses to answer priority questions for the Department; analysis topics include: high energy lasers for base defense, position, navigation, and timing in highly contested environments, electromagnetic spectrum maneuver and mission data integration, and rapid precision strike-next. These topics were identified through a OUSD(R&E)-led workshop which included participants from the Joint Staff, Combatant Commands, and other OSD organizations. The topics were subsequently approved by the Vice Chairman of the Joint Chiefs of Staff.

To perform these and other analyses, ME requires a technical database capable of managing a large amount of data and models. OUSD(R&E)'s new Mission Engineering Digital Environment (MEDE) serves as one such database, providing analysts with a collaborative, agile, secure, interoperable, and responsive digital environment in which to conduct ME activities. OUSD(R&E) is also standing up a mission integration/mission engineering war room to facilitate collaboration across all classification levels and to meet the technical demands of multiple concurrent analyses.

To further analyze the potential mission impacts of emerging technologies, OUSD(R&E)'s Strategic Intelligence and Analysis Cell (SIAC) established an Emerging Disruptive Technology (EDT) wargame series. Wargaming is an analytical approach that enables DoD to jump-start the innovation process by grappling with the implications of emerging technologies well in advance of their maturation. EDT wargames holistically examine emerging technologies' technical capabilities and policy considerations, as well as their potential impact on operational requirements and threats. EDT wargames have examined topics such as: autonomy in undersea warfare, AI's applications to command and control, directed energy weapons, and emerging technology considerations for the Joint Warfighting Concept (JWC). Wargame outputs help inform future concept and capability development, mission engineering studies, prototyping and experimentation, threat forecasting, and S&T investments.

EDT wargames also provide a unique opportunity to integrate a diverse set of subject matter experts across program office, technology, and Service stovepipes. EDT wargames include members of the technology, operational, and intelligence communities from OSD, the Joint Staff, the Services, Combatant Commands, and intelligence agencies. This inclusive approach creates a mutually beneficial feedback loop among the organizations and individual participants. For instance, the operational community gains a better understanding of the opportunities and risks of emerging technology and the technology community gains an appreciation for future concepts and capability requirements. Both communities further benefit by learning from the intelligence community's depiction of future threats.

These feedback loops were readily apparent in 2020, during EDT Wargame 4. By assessing the 2030 technology landscape and identifying technical opportunities for the S&T community to align with the JWC, EDT 4 informed JWC's Supporting Concept capability requirements. Additionally, within OUSD(R&E), wargames are designed to inform prototyping activities, to shape modernization roadmaps, and to integrate across technology portfolios, thus enabling OUSD(R&E) to deliver the next generation of integrated capabilities to the warfighter.

TRMC DELIVERS CAPABILITY FOR TEST AND EVALUATION

The Test Resource Management Center (TRMC) ensures the readiness of the test and evaluation (T&E) infrastructure and workforce. TRMC also supports DoD modernization by forecasting future test infrastructure needs, assessing current test ranges and facilities, and developing critical test technologies and capabilities for use across the DoD T&E enterprise. TRMC, of course, also supports DoD-wide modernization by facilitating testing of key capabilities. Recent examples include:

- Improved aeroshell testing by developing an arc heater that more accurately produces hypersonic flight conditions and can evaluate thermal protection system materials;
- Upgraded a wind tunnel by developing a nozzle that provides air flow up to Mach 18 and that enables the measurement of hypersonic aerodynamics and weapon system stability;
- Enhanced the realism of nuclear survivability testing by prototyping a test capability that produces ultra-short, pulsed neutron radiation and can be used to assess the survivability of microelectronics and critical control circuits; and
- Improved 5th/6th generation aircraft testing against modern air defense systems by fielding sixteen threat-representative radar signal to assess detectability, survivability, and system performance.

In addition to strategic modernization investments, TRMC also makes foundational investments to improve test capabilities and lower the cost of testing across the Department. For instance, TRMC fielded a common range instrumentation system at eight open-air ranges. This system tracks aircraft under test with sub-meter accuracy and securely transmits highly classified flight test data down to the ground at four times the rate of previous systems.

WHERE INNOVATION RESEARCH AND TECHNOLOGY BEGINS

The Deputy Director for Research and Technology champions the Department's relationships with academia, is piloting efforts to attract a new and more diverse talent pool to the Department's science, technology, engineering, and mathematics (STEM) workforce, is promoting the use of new hiring authorities and flexibilities, and through the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) is working to bring small and innovative businesses into the Department.

GROWING THE PIPELINE OF SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS (STEM) TALENT

The Science, Mathematics, and Research for Transformation (SMART) Scholarship Program provides scholarships to U.S. citizens to pursue bachelors, masters, or doctoral degrees, and in doing so, helps build a future workforce capable of addressing the Department's most challenging problems.

Upon graduation, recipients work in a civilian position in a lab or agency of the Army, Navy, Air Force, or other DoD entity and have a one-year service requirement for each tuition year. In 2019, DoD targeted scholars with academic backgrounds that aligned with DoD's modernization priorities, including: quantum science, microelectronics, biotechnology, and artificial intelligence. Continuing to recruit stellar candidates into the SMART program will enable DoD to build a workforce that is capable of addressing even the most challenging science and technology problems in the future.

OUR COMMITMENT TO DIVERSITY

To attract and advance an inclusive DoD STEM workforce, the Department's STEM Education and Outreach efforts are working to increase women's and other underrepresented groups' involvement. For example, OUSD(R&E) conducts SMART Scholarship program outreach at Historically Black Colleges and Universities and Minority-Serving Institutions (HBCU/MI). DoD's long-standing partnership with HBCUs/MIs not only contributes to a diverse STEM workforce, it also focuses research grants on core DoD modernization priorities. Furthermore, although the DoD's HBCU/MI program research focuses specifically on defense, program investments also contribute to commercial innovation.

The HBCU/MI Program also manages nine centers of excellence that provide leadership, research, and education in DoD priority areas. The newest centers focus on quantum sensing, artificial intelligence/machine learning, networks, aerospace education, research, and innovation. The program is also working to establish to new centers focused on biotechnology and materials science. Finally, two other centers of excellence have a STEM workforce focus, and are cultivating a cohort of students through an education program that is coupled with exposure to the DoD's research and development enterprise. Many of these students also participate in DoD internships; after completing internships, 57 STEM scholars who also participated in the DoD HBCU/MI Program have accepted job placements with defense laboratories since FY 2018.

LEVERAGING INTERNATIONAL TALENT

To stay ahead of our competitors, both economically and militarily, the U.S. must continue developing and attracting world-class scientists and engineers. The Department employs more than 130,000 scientists and engineers, and nearly half of this number work in one of the Department's laboratories or engineering centers. Despite challenges in recruiting and retaining technical talent, the Department maintains an exceptional workforce. Many of the U.S.'s top researchers and entrepreneurs have come here from other countries. To take advantage of this fact, in just the last year, OUSD(R&E) re-invigorated the Department's J-1 Visa waiver program. This effort will reduce barriers for foreign nationals who want to stay in the country to work in STEM fields.

Today's U.S. universities welcome a high percentage of international students, scientists, professors, and industry collaborators, and our adversaries compete with the U.S. to recruit from this same talent pool. Immigrants have been awarded 38% of the Nobel Prizes won by Americans in Chemistry, Medicine, and Physics since 2000 and immigrants or their children founded 45% of the 2019 Fortune 500 companies. We want these individuals to come here, stay here, and choose to work with us no matter where they were born. It is our strategic imperative to continue recruiting the best, highly-skilled individuals-regardless of national origin-to work within the U.S. research enterprise.

UTILIZING HIRING FLEXIBILITIES

The Department continues to make extensive use of recruitment and retention authorities to enhance its science and technology workforce. These authorities give Service laboratories the ability to conduct direct hiring in particular fields, such as cybersecurity, to support continuing education, provide recruitment bonuses, and reward employees with performance-based pay.

These tools allow DoD laboratories to recruit and retain top S&T talent and remain competitive with the private sector. For instance, the Air Force Research Laboratory (AFRL) has used the Enhanced Pay Authority to hire subject matter experts in the areas of autonomous systems, data analytics, and communications and networking, which directly enhances their ability to support the Department's modernization priorities.

THE ROLE OF SMALL BUSINESS

The Department invests nearly \$2 billion annually in innovative small businesses, entrepreneurs, and academic research institutions through the Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) programs. These programs provide the DoD access to the small business community, reaching experts and academics that may not otherwise be engaged.

Small businesses that begin working with DoD through the SBIR/STTR programs have the option of partnering with existing contractors or larger businesses that may already be working on Programs of Record or fielded services. For many small businesses this is a "foot in the door" providing experience working with the DoD

and providing DoD with access to new perspective and talent from the small business community. Moreover, SBIR/STTR projects are often dual-use, and are both transitioned to the military and commercialized for private-sector benefit. The Department facilitates both military transition and private sector commercialization opportunities through Component SBIR/STTR Commercialization Readiness Programs (CRP) and the OSD Transitions SBIR/STTR Technologies (OTST) Program. The Department also held its first Virtual Symposium on transition in October 2020 with over 1,000 participants from small businesses, primes, and academia.

DoD has focused the SBIR and STTR investment programs on the Department's modernization priorities. Additionally, DoD has streamlined and modernized the SBIR and STTR proposal submission process, with the goal of making these programs more accessible to small, domestic firms.

In order to promote small business within the defense contracting space, the DoD facilitates licensing opportunities through our national partnership intermediary, TechLink. Partnership with TechLink offers licensing support to small businesses working with the DoD, which is mutually beneficial, delivering value to the small business and enabling further innovation.

Additionally, the Department encourages larger defense contractors to work with small businesses, including SBIR/STTR performers, through specific subcontracting requirements and through the Mentor Protégé program managed by the Office of Small Business Programs within the Office of the Under Secretary of Defense for Acquisition and Sustainment. These mechanisms further assist small businesses to contribute to Defense innovation, while also making it easier to do business with the DoD.

HOW SMALL BUSINESS INNOVATION IN DOD HELPS AMERICA BROADLY

DoD reaps tremendous benefits from partnering with small businesses. A recent study of the SBIR/STTR programs found the Department achieved a 22-to-1 return on investment in small business research and development over the past 23 years, resulting in \$347 billion in total economic output. An economic impact study conducted in 2018 on the DoD license agreements active during the 2000–2017 period revealed \$27 billion in sales of new products and services, including at least \$5 billion in confirmed sales to the U.S. military. Overall, these agreements generated over \$58 billion in total economic impact and created approximately 215,000 jobs. In this study, small businesses accounted for approximately 80% of the licenses.

THE DEFENSE MANUFACTURING BASE

Manufacturing is critical to the advancement of our technology modernization objectives. The DoD Manufacturing Technology program (ManTech) executes a portfolio of project investments across OSD, the Services, and Agencies, focusing on advanced manufacturing technologies. The ManTech program also serves as a lead Federal strategic investment partner to 9 of the 16 Manufacturing USA innovation institutes (MIIs).

These MIIs promote domain-focused manufacturing ecosystems in areas of value to the Department and identify emerging areas of importance to the U.S. manufacturing base. The MIIs employ pre-competitive technology advancement and investment, and facilitate community building and workforce development. They bring together industry, academia, and federal partners to increase U.S. manufacturing competitiveness and promote a robust and sustainable national manufacturing R&D infrastructure.

For example, the Manufacturing times Digital (MxD) Institute recently welcomed 5G on its Future Factory Floor to serve as a testbed for demonstrating the opportunities 5G, artificial intelligence, and machine learning bring to manufacturing. The ManTech team has also begun to accelerate advanced manufacturing technologies through public-private partnerships in cybersecurity, photonics, and regenerative medicine.

Solar power and our most advanced medical diagnostic machines both depend on advanced photonics. The American Institute for Manufacturing Integrated Photonics (AIM Photonics) is an engineering technology consortium that has established a U.S.-based Photonic Integrated Chip (PIC) manufacturing ecosystem. This ecosystem is leading efforts in the prototyping, validation, and final packaging of advanced node microelectronics and photonic chip fabrication, and the development of test, assembly, and packaging facilities.

Last year the Department established its ninth DoD-lead Manufacturing Innovation Institute—BIOMADE, to specifically focus on bio-industrial manufacturing. This institute leverages emerging biotechnologies, including modern engineering biology techniques, to foster domestic leadership in bio-manufacturing. BIOMADE is

already building partnerships across the U.S. bio-economy and strengthening linkages between defense needs and industry and academic partners.

Hypersonic weapons depend on the manufacturability of carbon-carbon materials. Working to address this need, ManTech is sponsoring the manufacture of carbon-carbon composite for the Hypersonics Applications (MOC3HA) initiative. This effort works directly with domestic manufacturers of carbon-carbon material to streamline processes and improve quality and reliability volume and size, reduce cost and cycle time, and increase yield.

The department has convened a DoD-wide Manufacturing Council to coordinate activities addressing defense-wide challenges as well as human capital investments and strategies, and to serve as a touchpoint for industry. Through this Council, we align the funds in the ManTech program, Industrial Base Analysis and Sustainment effort, and Defense Production Act Title III authorities to achieve our modernization goals and to maintain our technical advantage.

SUPPORTING DOD'S MIIS RESPONSE TO THE COVID-19 PANDEMIC

America Makes, the DoD-sponsored institute for additive manufacturing, rapidly partnered with the Food and Drug Administration (FDA), HHS/Assistant Secretary for Preparedness and Response (ASPR), National Institutes of Health (NIH), and Veterans Affairs (VA) to efficiently and safely match health care provider needs for PPE. This project also developed a rapid method for design submission and approval of 3D PPE designs under DoD funding.

As of February 25, 2021, more than 624 published designs were available on the Exchange, with 34 designs optimized for clinical use and 28 designs optimized for community use. These designs have been downloaded over 200,000 times with more than 2.5 million views. Through the effort, America Makes assisted front line workers in obtaining hundreds of thousands of pieces of critical PPE supplies from qualified manufacturing across the U.S.

The NextFlex Manufacturing Innovation Institute facilitated a project that uses novel RNA sequencing technology to prove the environmental contamination and transmission pathway, then refined and expanded production capacity of antimicrobial mats called "clean surfaces" to address surface contact infections. Virus and bacteria surface contact infections are frequent, and pathogens often remain viable and contagious between surface cleanings even if proper episodic procedures are followed.

For this novel "clean surface" technology, any time microbes contact the mat surface, an embedded circuit board sends a micro-electric impulse along printed conductive traces to that location to activate antimicrobial silver and copper ions that quickly eradicate the contaminants. The flexibility of these mats allows them to be placed around the side rails of hospital beds, on tables, or doorknobs. The application of this innovation to public, medical and retail infrastructure in the long-term could impact how future viral outbreaks are controlled, especially during flu seasons. The mats went through validation testing throughout the University of Pittsburgh Medical Center hospital system and are now being installed in six hospital ICUs for a six-month experiment to measure pre- and post-infection rates.

The Advanced Functional Fabrics of America (AFFOA) is a DoD-sponsored advanced fabrics institute and was selected to participate on the Commonwealth of Massachusetts' Manufacturing Emergency Response Team. Alongside the Massachusetts Technology Collaborative, AFFOA helped administer \$5.6 million in funds for PPE through the Massachusetts MII program for domestic manufacturers pivoting to manufacture PPE, identified opportunities to rapidly optimize the PPE supply chain, matched PPE manufacturers with producers of raw materials, and connected hospitals to manufacturers to quickly produce needed products. AFFOA also built a distributed PPE material-testing network to assist hospitals, state emergency management agencies, first responder organizations, and domestic manufacturers to test their materials and PPE products and ensure product performance and regulatory compliance.

STRENGTHENING OUR DEFENSE RESEARCH BASE

Scientific discoveries occurring at universities and laboratories supported by the DoD, have led to dramatic commercial and national security advances and have significantly improved citizens' lives around the world. DoD's relationship with academia is an incredibly valuable force multiplier for the basic research enterprise.

In addition to our Defense Laboratories, the Department's FFRDCs and UARCs are a critical element of our innovation base, providing the independent and objective scientific and technical expertise that the Department relies on to create tech-

nical superiority. Last year, we undertook a concerted effort to ensure the Department employs our FFRDCs for maximum strategic impact.

In FY19, the FFRDCs and UARCs made numerous contributions to enhance the capabilities of the Joint Force. For example, the Aerospace Corporation was an integral part of the Government and contractor team that successfully launched a GPS III on a Falcon 9 rocket. This was the first flight of a competitively awarded National Security Space Launch mission in nearly 20 years. In another instance, the Johns Hopkins Applied Physics Laboratory developed a technically rigorous “space game” that enabled participants to grapple with realistic and technically informed timelines, authorities, questions, and rules of engagement, and the operational implications of pursuing different space architectures. Playing out these scenarios has informed the department’s investment decisions.

INTERNATIONAL PARTNERSHIPS

Our Allies are essential to our national security. This is true in research as it is in warfighting. We continue to develop our international partnerships through the SMART program. Two examples from the SMART program to highlight are the Alan Turing Institute in the U.K., where SMART scholars can perform research on artificial intelligence and machine learning, and the von Karman Institute for Fluid Dynamics in Belgium, where SMART scholars can perform research on hypersonics. Through these efforts, scholars work with their peers overseas improving our S&T community and contributing to the Department’s international partnerships.

TECHNOLOGY PROTECTION

Our military’s technological edge is at risk. Competitor nations are acquiring intellectual property and sensitive technologies from our academic research system and industry through illicit and legal means. The department is taking a multipronged approach to address this issue. We are applying protections for critical technologies and programs that prevent technologies from falling into the wrong hands. We are establishing procedures to reinforce the integrity of our research enterprise. We are also engaging the broader S&T community and our stakeholders to provide improved threat awareness, inform necessary controls, and develop best practices that can be institutionalized across the DoD S&T enterprise.

We continue to look for new methods to secure our technology. Technology Area Protections Plans (TAPPS) are new initiatives we are using to provide a common understanding of what needs to be protected and a strategy to establish protections. TAPPs will help S&T organizations get information regarding emerging and disruptive research that can be used to apply safeguards through Program Plans. The TAPPs in development align with the 2019 DoD list of critical programs and technologies mandated by Section 1049 of the FY2019 NDAA.

We have also taken other steps to protect open research at U.S. institutions. R&E is currently working with other federal research funding agencies to develop common standards for identifying and adjudicating conflicts of interest and conflicts of commitment. We are fully engaged with the White House Office of Science and Technology Policy to develop Federal guidance for Research Security and Integrity.

In March 2019, we issued instructions to our partners in academia, requiring that key research personnel funded by DoD grants, cooperative agreements, Technology Investment Agreements, and other non-procurement transactions disclose all current and pending projects and funding sources. We are also revising research grant and cooperative agreement procedures to exclude research funding for individuals posing an unacceptable risk to national security or participating in foreign talent recruitment programs. Moreover, DoD encourages academic institutions, associations, and councils to develop training modules for faculty to clearly explain the landscape of threats to research integrity.

Technology protection requires a nuanced and multifaceted approach as well as partnerships with other government agencies, industry, academia, and allies. An uncoordinated, broad-brush approach to technology protection can result in damaging consequences that inhibit leading-edge research. At the same time as we work to protect our technological edge, we recognize that the free exchange of ideas and collaboration are critical to our continued success. We must preserve the long-standing norms that have benefited our research institutions while at the same time punishing bad actors who break the law. While we must guard against espionage and the theft of intellectual property, we must also nurture an open, pioneering and collaborative culture that has historically served our country so well.

CREATING AND PROMOTING NEW TECHNOLOGIES

The office of the Director of Defense Research and Engineering for Modernization develops and coordinates Department-wide science and technology strategies to guide and drive technology development and inform requirements. By developing S&T roadmaps, we prioritize resourcing, support future technology insertion, and provide opportunities for investments to accelerate development efforts. Our current efforts are focused on 11 modernization areas; 5G, Hypersonics, Directed Energy, AI, Biotechnology, Microelectronics, Cyber, Quantum Science, Autonomous Systems, Fully Networked Command and Control, and Space.

Microelectronics

Microelectronics is a critical focus area for DoD Modernization. Advanced capability microelectronics technology development directly influences success in fielding disruptive technologies, including Artificial Intelligence, Hypersonics, and 5G. The US is struggling to maintain global competitiveness in leading edge fabrication and design innovation, despite supporting a diverse infrastructure of research, design, intellectual property (IP) rights, and physical plants that should enable the US to be an attractive market for the semiconductor industry. Additionally, aggressive investments and actions by peer competitor nations threaten U.S. leadership. Russia and China have publicly stated that advanced microelectronics and AI are the keys to economic and military dominance. Nearly 90 percent of the world's semiconductor foundry market share belongs to companies with foundries in Taiwan, South Korea and China. This imbalance is prompting calls to boost domestic capacity.

R&E's Trusted and Assured Microelectronics (T&AM) Program is executing the development of key technologies in accordance with the DoD Microelectronics roadmap. The broad goals of the T&AM program are to secure U.S. microelectronics interests, reverse the erosion of domestic innovation and supply, and establish a strong leadership foundation for the next-generation of microelectronics technology for DoD applications. We are involved in three lines of effort to reach these goals:

1. Assurance of the integrity of microelectronic products as they move through the supply chain through the development and application of enhanced assurance technologies, services, and standards.
2. Availability of critical and common IP, manufacturing capabilities, and assurance tools and services required for DoD research, development and acquisition programs.
3. Access to design modules, design capabilities, manufacturing, and verification and validation services at commercial sources with lowered barriers and integrity/confidentiality protection measures.

We plan to continue investing in advanced capability microelectronics, ensuring access to State of the Art microelectronics, advanced packaging and test, and to radiation hardened microelectronics. We are also moving forward with the establishment of the Joint Federated Assurance Center, and continuing to investment in the DARPA led Electronics Resurgence Initiative (ERI). ERI is intended to ensure U.S. microelectronics technology leadership well into the 21st century. ERI will pursue electronics performance advancements by leveraging circuit specialization, to include materials, architectures and designs.

ARTIFICIAL INTELLIGENCE

We are in a global arms race in artificial intelligence technology and applications, most notably with China, who has set a goal to lead in AI technology by 2030. To maintain US dominance in AI, we will:

1. Continue to invest in cutting-edge AI research through organizations such as DARPA and Office of Naval Research (ONR).
2. Democratize DoD AI innovation by developing modern data and software development processes providing end-users and warfighters the ability to engage with AI development directly.
3. Accelerate AI adoption by supporting a rapid development pipeline, from research to our engineering centers to the service software factories and program offices.

This three-prong approach will lead to: trusted AI capability that has high utility to the warfighter, decreased development timelines, lowered cost-structures and reduced maintenance; increased understanding and availability of DoD data which is so vital to AI development; and improved talent development and retention within the civilian and service member community. Although this revolution is in its early phase, the capability is currently being tested in such areas as predictive maintenance, business operations, and automated target recognition. More generally, AI

will enable a myriad of capabilities across the force, including intelligence fusion and analysis, planning and prediction, and longer-term autonomy.

Just as the second wave of AI research performed within the Department 20 years ago led to the explosion of commercial activity in the US today, R&E is heavily involved in a third wave of advanced AI techniques and capability that will further strengthen the American AI ecosystem and have future commercial impacts.

CYBER

Our adversaries are engaged in wide-ranging and highly impactful malicious activities in cyberspace, often with near-impunity. Fortunately, through the implementation of the 2018 DoD Cyber Strategy, which embraces a defend-forward and persistent engagement approach, US Cyber Command and the Service Cyber Components are now blunting and disrupting many of our adversaries' malicious cyberspace activities. Through this approach, and by leveraging new capabilities made possible through significant and long-term DoD S&T investments, our cyber forces are now exacting far greater costs on our adversaries.

To build on this momentum and ensure increasing dominance, our cyber strategy calls for increased investments to accelerate the development and rapid transition of technologies that provide the basis for 1) vastly enhanced resilience of DoD systems and critical infrastructure 2) substantially increased capacity and unrivaled capabilities for the conduct of cyber and cyber-enabled operations, 3) overmatching skills and expertise within the Cyber Mission Forces, and the Cybersecurity and Cyber S&T workforces.

Further, thanks to Congress' support of FY20 and FY21 appropriations totaling \$20M, OUSD(R&E) is awarding the first three academic Cyber Institute consortiums in April 2021. Known as VICEROY (Virtual Institutes for Cyber and Electromagnetic Research and Employ), they will prepare future ROTC and DoD-minded civilians for challenging cyber and electromagnetic spectrum operations and research careers through experiential learning. These increased investments in both technology and human capital will compound the dividends of the now decade-long increased focus, by DARPA and the Services, on the development of innovative and increasingly sophisticated cyber technologies.

5G

Technology to secure 5G communications is paramount to leveraging 5G for operations and communications superiority. As an investor in and significant consumer of technological innovation, the Department drives a cycle that parallels civilian industry and leads to new capabilities and services that would otherwise not be available. The technologies being developed and tested in the 5G Initiative will drive U.S. technology and innovation. Further, the dual-use applications being developed will help U.S. industry get 5G-enabled products to the commercial market more quickly while also providing DoD with new operational capabilities.

Security is often "bolted on" after a system has been developed. 5G networks, prototypes, and operating procedures are being developed now, and the 5G Initiative is actively working with industry to address security early by engaging both large integrators and non-traditional performers in experiments at over a dozen DoD facilities around the country. Examples include new 5G techniques for device authentication, using network slices (virtual networks on top of the underlying network) for threat detection and protection, and using multiple network paths for added resilience. We are working with industry and the standards community to build security into the design from the start, so security is viewed as a key metric, comparable to factors like network speed and latency.

Our 5G Initiative emphasizes Zero Trust principles, that is, moving away from defenses based on perimeters to defense in depth. Perimeter-based defenses are ineffective in dynamic environments that include multiple mobile devices, potentially untrusted supply chain components, and massive scale—all of which are anticipated under 5G. A perimeter defense is like a castle and moat defense; one builds a moat and wall around the protected center to keep the threat outside the castle and moat. In dynamic 5G environments, there is no castle. Instead, we need to think in terms of an in-depth defense strategy that assumes an adversary may be anywhere in the 5G environment. Continuous monitoring and rapid detection of unintentional faults and malicious attacks allow us to adapt in real time.

The 5G Initiative is developing multiple 5G testbeds across the country to demonstrate the efficiency and capability that 5G will enable for the Department of Defense. The testbeds provide the Services the ability to develop and test novel capabilities in at-scale environments that would otherwise not exist. The testbeds represent 10 different projects spanning 14 military locations and representing over seven tactical and operational mission areas/use cases. At Hill AFB, the 5G Initia-

tive develops technology to enable 5G networks to share spectrum with airborne radars dynamically. At Naval Base Coronado and Marine Corps Logistics Base Albany, the 5G Initiative is developing smart warehouse technology enabled by 5G. The technology will enable more efficient, accurate, and timely delivery of warfighting material. At Joint Base Lewis-McChord, the 5G Initiative develops Augmented Reality/Virtual Reality for the training environment.

Finally, ongoing dialogues with Service Programs of Record (PORs) ensure that the research projects address service requirements and that PORs are making plans to transition and incorporate successful 5G developments.

Autonomous Systems

DARPA's "Grand Challenges" on autonomous vehicles served as the primary catalyst for significant interest—and investment—by academia, industry, and government in autonomous systems. Building on this legacy, DoD application of intelligent, autonomous behaviors to robotic and unmanned systems (across all warfighting domains) is poised to allow humans and machines to team and achieve an overwhelming warfighting advantage not possible by humans or machines acting alone.

These behaviors increase efficiency by reducing the physical and/or cognitive loads on the warfighter; reduce risk to warfighters by reducing manned operation in harsh and unpredictable environments; and provide the potential to generate cost-effective combat mass. Moving beyond today's current limited fielding of intelligent autonomous systems that primarily support intelligence, surveillance, and reconnaissance activities with platform-level autonomous navigation, future capabilities will be applied across the spectrum of warfighting functions.

In the near-to-mid-term, autonomy efforts within research and engineering will result in advances in a number of areas, including; responsive fires support based for both manned and unmanned sensor and weapon systems; effective, resilient resupply using autonomous systems from point of manufacture to delivery; and joint all-domain and control enabled by autonomous systems increasing reconnaissance and surveillance ability.

To speed the development of these effective, appropriate, and safe intelligent autonomous systems, the DoD will continue to develop the digital engineering infrastructure necessary to design, fabricate, and test these systems throughout the entire Robotics and Autonomous System lifecycle. Successful fielding of these systems will leverage ongoing efforts to develop and implement a comprehensive Joint all domain command and control system as well as efforts to develop a secure cloud environment including a cloud-to-edge strategy suitable for contested environments. In concert, we must conduct virtual and live experimentation to fully explore future operational concepts as well as continue to develop sound, thoughtful, and ethical principles for the employment of Robotics and Autonomous Systems.

BIOTECHNOLOGY

Biotechnology will fundamentally change the future battlefield, and US adversaries (most notably China) are aggressively pursuing related capabilities. Furthermore, China has signaled willingness to use this and other emerging technologies against their opposition without respect for protocols, conventions, or human rights. Biotechnologies hold potential to broadly impact defense capabilities; however, until recently, DoD investments have almost exclusively focused on medicine and chem-bio defense missions.

A key application of biotechnology to national security is the ability of bioindustrial manufacturing to generate novel, domestic, safe, and sustainable sources of critical supply chain components. For example, a project executed by ONR and NAVAIR China Lake demonstrated the use of engineered bacteria to produce lin-alool, which can be efficiently converted to jet fuel, diesel, gasoline, and high density missile fuels. Other DoD efforts, such as DARPA's Living Foundries program, have illuminated the potential for more than 1,000 DoD-relevant molecules to be produced using biology.

The Department is prioritizing partnerships with Industry, to include BIOMADE—the newly awarded Bioindustrial Manufacturing Innovation Institute (MII)—and in collaboration with the Services, is focusing biotechnology modernization on: (1) building a common foundation of physical and digital infrastructure to create a rapid prototyping pipeline, (2) identifying and prioritizing use cases for prototyping and demonstration, and (3) enhancing workforce development opportunities. Investing in a pipeline for advanced development of bioindustrially-sourced products will not only provide critical materials and capabilities for our warfighters and maintain our competitive advantage in the field, a robust industrial base will also ensure that the future global bioeconomy is made in America.

DIRECTED ENERGY

Directed Energy Weapons can provide US forces with a high rate of fire weapon with a reduced logistical burden. This capability will be especially important as potential adversaries continue to develop advanced missile capabilities. We are working with the Services to accelerate operational weapon system development and operational experimentation, to build the industrial base, to develop the needed science and technology, and to carry out the capability development and demonstrations leading into programs of record.

Through our Laser Scaling Program, we are using industry to build 300 kW high-energy lasers by the end of 2022, and then we are increasing power to 500 kW by the end of 2025, and to 1000 kW by the end of 2028, all while reducing the size, weight, power, and thermal needs of these systems. Through our Rapid Prototyping Fund, the Navy will operationally test new laser and high-power microwave weapon prototypes at sea in 2020 and beyond. Further, we have partnered with the Special Operations Command to accelerate programs for airborne and land-based laser strike weapons. We have partnered with the Army Futures Command and the Navy to accelerate land- and sea-based laser and high-power microwave weapons for integrated air-and-missile defense, with initial demonstrations in 2022, key decisions in 2023, and initial capability in 2025.

In anticipation of new and more lethal directed energy weapons transitioning to programs of record, we are upgrading our test and evaluation capabilities with new infrastructure at the test ranges. Along with all this effort there is a tightly coupled science and technology effort aimed at lethality, beam control, propagation, power, and thermal management. Multi-domain mission analysis is being carried out to expand the range of missions and to enable directed energy weapons integration into the Joint Force.

FULLY NETWORKED COMMAND, CONTROL & COMMUNICATIONS (FNC3)

To improve command, control and communications (C3) the department is focused on providing the capability to evolve rapidly and independently between systems, equipment and users. This effort involves integrating stove-piped C3 systems into a layered architecture. The FNC3 effort is closely tied to Joint All Domain Command and Control (JADC2) and together these efforts are synchronizing investments across the DoD to ensure that the Joint Force's C3 are interoperable, resilient and capable.

By breaking-up the current stovepipes, we can increase resilience and improve Quality of Service (QoS—data rate and latency).

We are also making rapid developments in software defined radios and investing digital active electronically scanned antennas and optical communications systems. This will strengthen the resilience of individual links, grow capacity, improve interoperability and enable rapid fielding of better waveforms and algorithms. DoD is already transitioning and taking advantage of these new capabilities, such as the upgrades to the Multifunctional Information Distribution System (MIDS), which includes Link-16, and the Warrior Robust Enhanced Network (WREN).

We are leveraging recent concepts in Software Defined Networking (SDN) such as network slicing, to manage all the available diversity and deliver the much needed resilience with the necessary Quality of Service. Our investments are targeted at optimizing SDN concepts to our DoD tactical and strategic networks, as they are different from the commercial networks where SDN has been implemented to date. The US Navy's Tactical Data Dissemination Initiative (TDDi) is an early transition of these SDN technologies. To improve interoperability between applications in the short term, machine-to-machine interoperability technologies (e.g. efficient translators) such as DARPA's STITCHES program are ready for transition.

In the medium and long-term the Department (led by the DoD CIO's Office) is moving towards a federated data-centric architecture to reduce the overhead associated with current approaches to interoperability. In support, we are investing in a data-centric approach to C2 messaging (known as Universal Command and Control—UC2) that takes advantage of a recent encoding innovation, variable format binary (e.g. ProtoBuf and EXI), to produce a C2 messaging standard that is simultaneously efficient, evolvable and broadly applicable. An initial demonstration of the data-centric C2 techniques applied to the Counter Unmanned Ariel Systems mission is planned for the end of this year. Improving our C2 applications ability to better infer relevant information from the available data and provide decision support is also key to better C2 with investments coordinated across multiple modernization portfolios including AI, Autonomy and FNC3.

HYPERSONICS

Hypersonic systems take advantage of speed, maneuverability and sustained flight in the altitude gap between air defenses and ballistic missile defenses to provide transformational capability for survivable, long-range, lethal, time-critical strike of heavily defended and high value targets.

Hypersonic systems are enabled by innovations in highly integrated aerodynamic configurations, high temperature materials and structures, high speed propulsion, and advanced guidance, navigation and control. Over the past decade, focused research, development, test and evaluation has created the opportunity to rapidly transition developmental system concepts to weapon system prototypes and to operational weapon systems. We are working in close coordination with the Services to accelerate development and fielding of multiple air, land and sea launched conventional hypersonic strike weapons to defeat targets of critical importance.

Our potential adversaries are rapidly evolving high-end offensive and defensive systems creating highly contested anti-access/area denial (A2/AD) environments that challenge our tactical battlefield dominance and necessitate the development of hypersonic strike capabilities.

Additionally, our potential adversaries are aggressively pursuing, and now fielding a variety of hypersonic systems. This compresses the timescale on the tactical battlefield, creating asymmetry, which we are working to address. We will continue to implement our integrated strategy to enable fielding of operational prototypes in quantity from land, sea and air by the mid-2020s.

We are also working with the Missile Defense Agency to accelerate a comprehensive layered defeat capability against adversary tactical hypersonic weapons including kinetic defense in the terminal and glide phases of flight, as well as left-of-launch strike of missile launch complexes. The DoD hypersonics capability fielding strategy is being implemented through a highly coordinated set of programs across the services and agencies, to include a joint service memorandum of agreement and middle tier acquisition programs to effectively accelerate capability to the warfighter. Critical investments in our industrial base, our workforce, applied technology, and test infrastructure are being made to enable this acceleration and to pave the way for technical superiority for decades to come.

The Joint Hypersonics Transition Office (JHTO), which resides in our Advanced Capabilities directorate, works in close coordination with our Principal Director for Hypersonics to accelerate the development and transition of hypersonic technology to the warfighter. As the engineering and execution arm for hypersonics in the Office of the Secretary of Defense, the JHTO works closely with the Principal Director for Hypersonics to identify and address critical science and technology and workforce gaps and opportunities to ensure the success of the Hypersonics Strategy. In a resource-constrained environment with an adversary operating with more resources and faster development timelines, the JHTO addresses the need to accelerate and more efficiently develop hypersonic technologies by tying S&T investments directly to identified military needs, providing mechanisms for closer collaboration and coordination across the government, and identifying opportunities to tap into non-traditional performers such as universities and foreign allies.

The JHTO has five lines of effort aimed at increasing the speed of innovation in the U.S. and allied hypersonics enterprise:

1. the JHTO develops capability-based S&T roadmaps covering basic and applied research to guide the hypersonics S&T enterprise and funded \$48M in FY2020 in 28 projects to accelerate technologies that address the most critical S&T gaps.
2. the JHTO is sponsoring an effort with Boeing and Aerojet and the AFRL to mature a propulsion design to enable a hypersonic cruise missile option for aircraft carrier-based F/A-18s and a joint USAF/USN missile.
3. the JHTO in November 2020 stood up a university consortium of applied hypersonics at the Texas A&M Engineering Experiment Station (TEES) that enables nearly 100 universities to work on applied hypersonics research, provide expertise to the government, and to address workforce gaps. The JHTO is funding \$20 million a year in university research through the consortium and has made this research ecosystem available to the rest of the government to access applied hypersonics research.
4. As the lead for allied engagements in hypersonics, the JHTO is the co-chair of the Australia-US Hypersonics Working Group (HWG) formed in August 2020 to develop a bi-lateral strategy and coordinate S&T and activities in hypersonics.
5. the JHTO in October 2020 stood up the JHTO Systems Engineering Field Activity at NSWC Crane in Indiana to provide the systems engineering rigor

to JHTO-funded S&T efforts to ensure that they can transition into our programs.

QUANTUM SCIENCE

Successes in the area of quantum science research at DoD demonstrates how early-stage research can have a multiplier effect in other areas important to national security. A clear line can be drawn to the 20+ years of basic research funding within the DoD, and the major successes we are now seeing in U.S. commercial industry related to atomic clocks, quantum computing, the growing importance of quantum sensors, and quantum networks. These quantum technologies have significant economic and national security impact, made possible as a result of long-term, dedicated basic research funding.

Recent increases in federal funding through the National Quantum Initiative Act have led to increased levels of coordination with government partners. Increased commercial investments in quantum computing and quantum sensors are leading to new opportunities for DoD to engage and look towards transitioning this technology for military advantage. DoD is focused on the long-term opportunities of this technology for both military and civil applications.

Advances in quantum science are only beginning, and there is much more potential to discover through research. As quantum technologies develop, their importance to our economy and to national defense are likely to increase.

SPACE

The US cannot cede its dominance in space. Space related work will enable the US economy, diplomacy, and the military.

The dominance of the US in space is being challenged. Potential adversaries are showing their ability to rapidly deploy space capabilities, they are extending their reach to the Moon, the area between the Moon and the Earth, and they are innovating with technologies that challenge norms of behavior and provide asymmetric advantages threatening both terrestrial and space capabilities.

We are exploring numerous game-changing technologies with the labs and international partners such as advanced quantum encryption, artificial intelligence and smaller satellites that provide more capabilities, and austere on-demand responsive launch systems. Most notably, we have just initiated a new space research consortium program to mine the best and brightest researchers from universities and the tech base to focus on the hardest of space challenges identified collaboratively through a Board of Directors consisting of R&E, US Space Force, DARPA, DIU, Department of Energy, NASA and others. In addition to speeding the deployment of new space technologies through efforts like SpaceWerx and the space software factories, we are exploring cis lunar architectures and technologies such as space domain awareness, rapid maneuver and long-duration station keeping, through collaborative efforts in nuclear power and propulsion with the Department of Energy.

MISSILE DEFENSE AND SPACE DEVELOPMENT AGENCIES

The Missile Defense Agency (MDA), the Defense Innovation Unit (DIU), and the Space Development Agency (SDA) fall under the R&E umbrella. MDA and SDA are working on programs providing our nation with defense against some of the most advanced threats in the world. DIU plays an essential role in providing an entry point for innovators in the private sector to engage with needs of the DoD.

MISSILE DEFENSE AGENCY

The Missile Defense Agency (MDA) is developing capability and technologies that address the evolving missile threat. MDA will develop a Next Generation Interceptor (NGI), which improves homeland missile-defense performance and survivability against the assessed rogue nation threats as part of the Missile Defense System (MDS). In FY 2021, MDA will award the design and development activities for two competitive NGI development contracts. The initiation of the NGI program and the continued Ground-based Midcourse Defense Service Life Extension Program will extend the existing Fort Greely, Alaska, and Vandenberg Air Force Base, California, capability to defend the homeland from ballistic missiles beyond 2030.

The Department is investing in technologies and studying capabilities to defeat regional offensive hypersonic weapons, the first element of which is to detect and track incoming missile threats. MDA delivered a capability for USINDOPACOM for real-time sensing and display of hypersonic and maneuvering vehicle tracks. This capability is operational now in support of the Missile Warning and Missile Defense missions. In collaboration with industry partners, US Space Force, USNORTHCOM,

USSTRATCOM, USSPACECOM, and the Space Development Agency, MDA is pursuing a Hypersonic and Ballistic Tracking Space Sensor (HBTSS). Once deployed, HBTSS will become a key element of the MDS in hypersonic defense by providing a persistent, layered capability to detect and track dim boosting ballistic missiles, hypersonic glide vehicles, and raids in all phases of flight. MDA awarded two agreements earlier this year to industry to build an on-orbit prototype-demonstration space vehicle for a planned launch in 2023.

With the achievement of Initial Fielding in fourth quarter FY 2021 and operational acceptance in first quarter FY 2023, MDA will add the Long Range Discrimination Radar in Alaska into the MDS architecture to provide a persistent capability to defend the United States homeland against IRBMs and ICBMs. This past year the Department demonstrated the ability of the Patriot missile defense system to intercept a short-range ballistic missile target using THAAD/AN/TPY-2 track and discrimination data. MDA also is continuing to mature an integrated air and missile defense capability for regional defense.

MDA, in cooperation with the U.S. Navy, demonstrated early capability against maneuvering threats during flight-testing of the Standard Missile (SM)-6 Sea-Based Terminal (SBT) defense, and it will further demonstrate this capability against an advanced maneuvering threat-representative target later this year. We will continue to advance our SBT capability to address the regional hypersonic threat and will test that capability in the FY 2024 timeframe. MDA plans to accelerate the hypersonic missile defense program under a newly designated Glide Phase Intercept initiative to develop a capability to defeat a regional hypersonic threat. The eventual goal is providing greater depth of fire in a regional layered defense architecture. MDA is also pursuing advances in joint all-domain and global command and control to support USNORTHCOM in countering very long-range cruise missiles.

The Department's previous missile defense technology innovations have transitioned into weapon systems and vastly improved interceptor seeker capability, increased the speed and range of intercept with advances in propulsion, and increased the probability of single-shot kill using multifaceted tracking and discrimination algorithms. As an example, the technologies developed as part of the Multiple Object Kill Vehicle effort were presented to NGI bidders, and may be included in the proposals. Additionally, MDA invested in directed energy kill mechanisms, including multiple laser types, high-powered microwave, and component technologies to support development of sensors and interceptors, such as beam control and lethality. These investments allow the country to outpace the missile threat. We must continue to sustain, modernize, and expand the MDS by pursuing rapid, yet measured, development of advanced missile defense concepts and technologies for homeland and regional defense.

MDA is continually assessing emerging and disruptive technology for potential applications to missile defense utilization. Investments are being made in Artificial Intelligence, Machine Learning, Nanosat technology, Left-through-Right integration, Cybersecurity, and Quantum Science. Key to understanding the potential of technology has been the development of testbeds that allow MDA to exercise and demonstrate capabilities and test new concepts, algorithms, simulations, and software. MDA works extensively with partners, leveraging and expanding technology opportunities through cooperative, collaborative engagements with DoD partners, DoE labs, academia and U.S. allies and international partners.

MDA continues to drive for the inclusion of small businesses and universities through outreach, such as their Industry Innovation Summit and University Innovation Summit. These events present MDA's greatest technology challenges and offer one-on-one sessions for the Nation's most innovative minds to present their capabilities and solutions. MDA is committed to ensuring the use of small business to the maximum extent practicable, monitoring prime contractor performance to ensure contractors are achieving their proposed small business goals and objectives and have a mitigation plan in place to do so. MDA actively supports the DoD Mentor Protégé Program (MPP), currently overseeing five active DoD MPP agreements.

The MDA Small Business Advocacy Council (MDASBAC) consists of MDA large prime contractors dedicated to fostering and showcasing a superior collaborative environment to develop and promote successful small business relationships to achieve common goals. MDA has a robust outreach program and takes full advantage of the outreach resources administered by Procurement Technical Resource Centers/Small Business Development Centers to connect large defense contractors with viable small businesses to support the agency's mission.

SPACE DEVELOPMENT AGENCY

The Space Development Agency (SDA) was established in March 2019 to develop and field an alternative National Defense Space Architecture and accelerate the deployment of next-generation space capabilities to the warfighter. SDA is developing capabilities to address a wide range of national security space needs identified in the DoD Space Enterprise Vision of August 2018. To address current near-peer threats, SDA is focused on the most urgent of these needs by delivering a mesh network that will provide low-latency data transport in space to enable advanced missile tracking and beyond-line-of-sight targeting of land and maritime targets.

At its second anniversary in the Department, SDA has shown itself to be a “constructive disruptor” in national security space. Its model is tied to two main pillars: proliferation of satellites in Low-Earth Orbit (LEO) and spiral development, delivering new capabilities on-orbit every two years, starting in FY22. SDA’s mission begins and ends with the warfighter, guiding SDA to stick to schedule so that needed capabilities are available for end users to address the threat at or ahead of need. The Agency has established a Warfighter Council to ensure the needs of the Combatant Commands, Services, Joint Staff, and Intelligence Community determine the minimum viable product for each tranche, or generation of satellites.

SDA is hitting its milestones and forming partnerships with the Services, Combatant Commands, and other DoD agencies to reduce risks and gain user insight. The agency delivered two satellites for launch nine months after receiving funding, was designated by the Department of Defense as the lead for the proliferated LEO Joint All-Domain Command and Control (JADC2) backbone, and awarded contracts for all four segments of its initial tranche. SDA is preparing to launch several capability demonstrations and risk-reduction experiments this year, in partnership with others from across the space enterprise, including DARPA, the Air Force Research Lab, Missile Defense Agency, and several small businesses developing state-of-the-art space technologies.

SDA actively seeks ways to leverage commercial advances in technology to enable its space architecture. New space companies are supplying satellites for the first generation of the architecture as well as the launch vehicle for that tranche. To kick off 2021, SDA published an update to the National Defense Space Architecture (NDSA) Systems, Technologies, and Emerging Capabilities (STEC) Broad Agency Announcement (BAA) seeking studies, technologies, and prototypes that enable Real-Time Global Awareness and Connectivity; Comprehensive Space-Based Sensing; and Omniscient Command, Control, and Execution. This BAA is in place to establish an “intellectual pipeline” to access ideas from across the community to inform the future architecture, enable leap-ahead improvements for future tranches, and enable new capability layers that address emerging warfighter needs. SDA is also focusing on maturing and transitioning technologies from America’s small businesses, start-ups, and research institutions through a series of SBIR/STTR opportunities this spring.

In FY22, SDA will launch and operate the first tranche of satellites to demonstrate the Transport layer, the mesh network of communications satellites, and the Tracking layer, Overhead Persistent Infrared (OPIR) sensing satellites that provide missile warning, detection, and tracking capabilities. Tranche 1, the next generation of these capabilities, is slated for delivery in FY 2024, followed by future generations every two years that will incorporate battle management command and control and other layers of capability needed to provide persistent global access to protect national security. In FY23, the SDA will transition to the Space Force in accordance with the direction of the National Defense Authorization Act for FY 2020.

CONCLUSION

Our mission is to foster technological dominance across the Department of Defense, ensuring the unquestioned superiority of the American joint force. We are dedicated to ensuring that the technological edge remains in our favor. This statement while comprehensive, is not exhaustive in capturing all the activities being undertaken to maintain technological dominance in the present and future. The projects and programs contained in this statement do provide important examples of how crucial innovation is to the national security of the United States. I thank you for your time and I look forward to your questions.

Senator TESTER. Now we’ll go to Dr. Tompkins for her statement.

STATEMENT OF DR. STEFANIE TOMPKINS, DIRECTOR, DEFENSE ADVANCED RESEARCH PROJECTS AGENCY

Dr. TOMPKINS. Chairman Tester, Ranking Member Shelby, and Members of the Subcommittee, thank you for the opportunity to testify today and for your strong support of DARPA over the years.

My name is Stefanie Tompkins, and I serve as the Director of the Defense Advanced Research Projects Agency or DARPA.

It's a real pleasure to be here with my friend and colleague Ms. Barbara McQuiston from the Office of the Under Secretary of Defense for Research and Engineering.

While we work closely with Ms. McQuiston's organization, DARPA has a unique mission in both the DOD community and the broader U.S. technology ecosystem. That mission is to prevent strategic surprise by making investments in breakthrough technologies for national security.

What that means is we anticipate, create, and demonstrate technologies that are nowhere on technology roadmaps and often outside most people's imaginations.

For over 60 years now, in partnership with innovators, inside and outside government, DARPA has repeatedly delivered on our mission. We've transformed revolutionary concepts and seemingly impossibilities into practical capabilities.

Examples of those capabilities include stealth technology, precision-guided weapons, unmanned aero-vehicles, as well as many icons in modern society, such as the Internet, automated voice recognition and language translation, and GPS receivers small enough to embed in nearly any consumer device.

Technologies like these provide more options for our Nation's leaders and the military services and today, with increasingly complex challenges and a rapidly-changing world, DARPA's role has never been more vital.

At DARPA, we think not just about scientific and engineering innovation now but also about the innovation ecosystem. That ecosystem includes many overlapping and adjacent communities from academia, industry, and government. It includes everything from fundamental research to global scale systems of systems. It includes innovation not only in technology but in processes and transition strategies, as well, and, most importantly, it includes a rotating cast of DARPA program managers who come from and will return to that ecosystem and who seek to solve not just today's problems but tomorrow's, as well.

One of the best illustrations of how DARPA works is related to the COVID-19 pandemic. So about 5 years ago, when I was serving in a different role at DARPA, I spent a lot of time on the road trying to expand and diversify our pro forma base.

One of the programs I talked about the most involved heavy investment into something called mRNA vaccines. So mRNA vaccines are pretty much a household word today, but at the time they were much, much more obscure and DARPA's investments were based on the insight of individual program managers who anticipated their need for both military and public health missions.

The research that DARPA first initiated more than a decade ago is now playing a leading and catalytic role in today's fight against COVID-19. In typical DARPA fashion, we made significant invest-

ments in the technology years before it was known to be needed, leading to high-impact capabilities related to prevention, diagnostics, and treatment that have helped to mitigate the current crisis.

From vaccines and diagnostics to defensive and offensive hypersonic technologies, state of the art artificial intelligence, quantum systems, micro-electronic solutions, and much, much more, DARPA has forged new paths and continues to deliver on our mission.

I look forward to working with the members of this subcommittee and others in Congress to ensure the security and resilience of our Nation, and I would be most pleased to answer your questions.

[The statement follows:]

PREPARED STATEMENT OF DR. STEFANIE TOMPKINS

Chairman Tester, Ranking Member Shelby and Members of the Subcommittee, thank you for the opportunity to testify before you today. I am Stefanie Tompkins, Director of the Defense Advanced Research Projects Agency, DARPA. It is a pleasure to be here with my colleague, Ms. Barbara McQuiston, from the office of the Undersecretary for Research and Engineering (USD(R&E)) in the Department of Defense. Our organizations work together every day to advance our Nation's defense technologies. DARPA plays a particular role in this community and in the broader U.S. technology ecosystem. That role is to anticipate, create, and demonstrate breakthrough technologies that are outside and beyond conventional approaches—technologies that hold the potential for extraordinary advances in national security capability.

For more than 60 years, DARPA has held to a singular and enduring mission: to make pivotal investments in breakthrough technologies for national security. Working with innovators inside and outside government, DARPA has repeatedly delivered on that mission, transforming revolutionary concepts and seeming impossibilities into practical capabilities. The results have included game-changing military capabilities like precision weapons, stealth technology, and unmanned aerial vehicles, as well as icons of modern civilian society such as the internet, automated voice recognition and language translation, and Global Positioning System receivers small enough to embed in myriad consumer devices.

DARPA creates and executes programs that rely on and inspire an innovation ecosystem of academic, corporate, and government partners. We focus on developing capabilities for national security leaders and the nation's military services, who work with us to create new strategic opportunities and novel tactical options. For decades, this interlocking ecosystem of collaborators has proven to nurture intense creativity. Today, DARPA's role has never been more vital. From being front and center in our nation's fight against the COVID-19 virus, to defensive as well as offensive hypersonics technologies, state of-the-art artificial intelligence, quantum technologies, and directed energy solutions, DARPA today is delivering on our most pressing security needs.

DARPA pursues game-changing technologies and capabilities in a way that provides surprising advantage for U.S. and Allied warfighters and at a much faster pace than the state of the art. DARPA's work with the Services and other agencies aims to meet not just known but as-yet unrecognized needs and move swiftly to deployment. That includes an increased emphasis on prototyping and joint projects—and, especially, a tighter emphasis on designing, building, and testing aspects of technology. Today, I will focus my testimony on how DARPA seeks to: 1) counter near-peer adversaries, 2) extend DARPA innovation to the warfighter and beyond, and 3) promote continued American innovation throughout the broader S&T ecosystem of university and industry partners.

1. Countering Near-Peer Adversaries

We seek to present adversaries with surprising warfighting scenarios that create dilemmas or completely disrupt their decision calculus. To do so, we must disrupt our own warfighting enterprises and provide decisive advantage across air, land, and sea, as well as space, cyberspace, and the electromagnetic spectrum. Big, monolithic platforms designed, built, and procured to do everything cost too much, take too long to field, and are usually technologically outdated by the time they are available. DARPA seeks a new asymmetric advantage—one that imposes complexity on

adversaries by harnessing the power of dynamic, coordinated, highly autonomous, and flexible architectures.

A. New Warfighting Constructs

Modern warfare is becoming less about singular platform and weapon capabilities, and more about combinations of systems that can be rapidly developed and composed into more effective warfighting constructs. DARPA's Assault Breaker II (ABII) and Mosaic initiatives, along with their resulting technologies, seek to fundamentally change the way the military thinks about designing, buying, and deploying future systems.

First, the ABII program addresses several challenges posed by our near-peer competitors. Patterned after the original Assault Breaker program in the late 1970's, a memorandum of agreement was signed by DARPA and the vice chiefs of all five Services to establish a joint service team creating technology solutions to these critical challenges. Interacting closely with the intelligence, military operator, and technology communities, the team's first objective is to design warfighting operational constructs based on new and emerging technologies and capabilities.

The program's second objective is to develop an advanced modelling and simulation environment to support analysis of true cross-domain (seafloor to space) cross-service warfighting constructs. Finally, the program is tying the advanced modelling and simulation environment into an interactive experiment environment to support exploration of highly complex, interdependent approaches that characterize the future of warfighting.

ABII seeks to organize this evolution in warfighting and act as a conduit to both communicate technology solutions to the services as well as articulate critical challenges to the technology development community in a manner where they can appreciate the larger picture. ABII will serve as the technical baseline for multi-domain operations moving forward.

In addition to ABII, DARPA has also been spearheading the "Mosaic" construct of future warfare. The Mosaic concept posits that using less expensive systems brought together on demand as the conflict unfolds, could facilitate the creation of "effects webs," enabling diverse, agile applications—from a kinetic engagement in a remote desert setting, to multiple small strike teams operating in a bustling megacity, or an information operation to counter an adversary spreading false information in a population threatening friendly forces and strategic objectives. Mosaics, therefore, can rapidly be tailored to accommodate available resources, adapt to dynamic threats, and be resilient to losses and attrition. Two Mosaic-related technologies—a novel decision aid for mission commanders and a rapid software integration tool—played a critical role in the recent Air Force demonstration of the Advanced Battle Management System (ABMS).

The Adapting Cross-domain Kill-webs (ACK) program and the System-of-systems Technology Integration Tool Chain for Heterogeneous Electronic Systems (STITCHES) were among a number of technologies employed late last summer in the ABMS on-ramp demonstration, which involved attacks using live aircraft, ships, air defense batteries, and other assets. ACK is developing a decision aid for mission commanders to assist them with rapidly identifying and selecting options for tasking—and re-tasking—assets within and across organizational boundaries. Specifically, ACK assists users with selecting sensors, effectors, and support elements across military domains (space, air, land, surface, subsurface, and cyber) that span the different military services to deliver desired effects on targets. Instead of limited, monolithic, pre-defined kill chains, these more disaggregated forces can be used to formulate adaptive "kill webs" based on all of the options available.

ACK was used in an air defense scenario during the ABMS demonstration, where an air commander faced incoming aerial threats and needed to quickly decide the best way to counter them. In the demo, the ACK decision aid software analyzed thousands of options to form cross-domain kill-webs and recommended assets and the best command-and-control "play" to the mission commander.

The machine-to-machine communications to enable this distributed fire control was performed by the STITCHES integration toolchain. STITCHES is a software-only and fully government owned (non-proprietary) toolchain specifically designed to rapidly integrate heterogeneous systems across any domain. STITCHES innovation is in auto-generating middleware between systems without needing to upgrade hardware or breaking into existing system software. The toolchain does not force a common interface standard; rather it rapidly creates the needed connections based on existing fielded capabilities obviating the need to upgrade in order to interoperate.

B. Responsive and Flexible Space Operations

The Department of Defense has prioritized rapid acquisition of small satellite and launch capabilities. Through leveraging commercial acquisition practices, DARPA has been able to streamline a number of militarily-relevant missions in the last year from conception through services acquisition and launch. These missions are validating emerging concepts for resilient capabilities that would reside in low Earth orbit—a capability which will revolutionize communications, intelligence, surveillance, and reconnaissance.

Right now, satellites critical to our national security and warfighting capabilities traditionally are custom designed. In the increasingly contested space environment, these exquisite yet costly and monolithic systems have become vulnerable targets that would take years to replace if degraded or destroyed.

Meanwhile, the evolution of commercial space has led to the design and manufacturing of LEO constellations intended for broadband internet service, which could offer previously unavailable economies of scale. DARPA is interested in leveraging these advances through our Blackjack program and driving them forward in order to demonstrate military utility.

Blackjack aims to develop and demonstrate the critical technical elements for building a global high-speed network backbone in low Earth orbit. That would enable highly networked, resilient, and persistent DoD payloads that provide over-the-horizon sensing, signals, and communication, and hold the ground, surface, and air domains in constant global custody. To do that, researchers are investigating innovative vehicle delivery approaches that enable revolutionary advances in payload size, weight, power, and cost.

For Blackjack, we are targeting a series of risk reduction rideshare flights that will continue through this year. With these flights, the goal is to develop and validate the technologies necessary for the Blackjack constellation.

C. Attribution of Malicious Cyber Actors

DARPA researchers are identifying and addressing critical cyber vulnerabilities that threaten global stability and security. Malicious actors in cyberspace currently operate with little fear of being caught due to the fact that it is extremely difficult, in some cases perhaps even impossible, to attribute malicious actions in cyberspace to specific individuals. The reason cyber attribution is difficult stems at least in part from a lack of end-to-end accountability in the current internet infrastructure.

To address this problem, DARPA launched the Enhanced Attribution (EA) program. EA is making currently opaque malicious cyber adversary actions and individual cyber operator attribution transparent by providing high-fidelity visibility into all aspects of malicious cyber operator actions. Furthermore, if successful, EA will increase the government's ability to publicly reveal the actions of individual malicious cyber operators without damaging sources and methods. Over the last three years the program has developed techniques and tools for generating operationally and tactically relevant information about multiple concurrent independent malicious cyber campaigns, each involving several operators, and the means to share such information with U.S. law enforcement, intelligence, and Allied partners.

Late last year, DARPA EA researchers used their data analytics to develop timely, accurate threat information regarding Russian-attributed malicious cyber infrastructure and associated actor personas. EA shared this information with close partners at the FBI Atlanta and Pittsburgh field offices, contributing to the October 2020 indictment of six GRU personnel associated with a worldwide destructive malware campaign and the remediation of that malware campaign in U.S. and Allied critical infrastructure.

D. Hypersonics

The ability to field hypersonic systems ranks high on the DoD's list of priority technologies, due in part to the pace of research by peer adversaries. Hypersonic flight at velocities of more than five times the speed of sound offers major advantages on the tactical battlefield, especially for conducting military operations from longer ranges, with shorter response times, and enhanced effectiveness compared to current military systems.

DARPA is developing technology demonstrations in 2021 for a number of operational capabilities. For example, the Hypersonic Air-breathing Weapon Concept (HAWC) program is a joint effort with the U.S. Air Force (USAF) seeking to develop and demonstrate critical technologies to enable an effective and affordable air-launched hypersonic cruise missile. The program emphasizes efficient, rapid, and affordable flight tests to validate key technologies. HAWC is pursuing flight demonstrations to address three vital technology challenge areas: air vehicle feasibility, effectiveness, and affordability.

The Tactical Boost Glide (TBG) program is another joint DARPA/USAF undertaking, striving to develop and demonstrate technologies to enable future air-launched, tactical-range hypersonic boost glide systems. In such systems, a rocket accelerates its payload to high speeds, the payload then separates from the rocket, and glides unpowered to its destination. TBG plans to include ground and flight-testing in 2021 to mature critical technologies and demonstrate system performance.

2. Innovations for the Warfighter and Beyond

A. Stopping Pandemics

A primary aim of the DARPA Biological Technologies Office (BTO) is to improve total force health protection and readiness. One of the biggest vulnerabilities to deployed military personnel and civilians is a lack of protection against many endemic and emerging bio-threats (e.g., the ongoing COVID-19 pandemic, or mosquito-borne viruses such as Chikungunya and Dengue).

DARPA's approach to pandemic prevention advanced the current state of the art by enabling antibody discovery in days to weeks rather than months to years. Additionally, DARPA investments in new diagnostic platforms allowed researchers to pivot rapidly to emergent viruses such as COVID-19. In 2011, DARPA began investing in gene-encoded vaccines based on DNA or RNA. Unlike traditional vaccines, which nearly all require laborious, expensive, and lengthy development times to counter each new threat, gene-based vaccines have the advantage of directly delivering coded genetic instructions to the body on how to produce its own protective antibodies against a specific threat. This means gene-encoded vaccines can be easily manufactured at scale using largely synthetic processes, versus being cultured in eggs; transported and stored without many of the cold-chain logistics required by traditional medical countermeasures; delivered with near-immediate efficacy; and safely expressed in the body for only a limited duration, causing no permanent alteration to the genome. This approach has shown great promise as a means to provide safe, reproducible, long-term immune protection. However, vaccines often require more than one dose and weeks to months before protected status is achieved, creating vulnerability either directly to warfighters if they are deployed before immunity has been established or to the mission due to the delayed deployment of personnel until they achieve immune protection.

DARPA's fundamental research and development (R&D) investments, fortunately, have resulted in discovery of several gene-encoded monoclonal antibody platforms, and has greatly de-risked the gene-based medical countermeasure (MCM) field. DARPA R&D investments have catalyzed significant commercial and transition interest. Several companies (including Moderna, AstraZeneca, and Inovio) have made major investments in the budding field of gene-encoded MCMs and have released vaccines to curb the spread of COVID-19. DARPA investments also spurred spin-out companies such as RenBio, which is optimizing the delivery of gene-based MCMs for increased efficacy and tolerability.

Early in 2020, DARPA allied closely with department medical and chem/bio defense organizations as well as Health and Human Services (HHS) components to join the fight against COVID-19. Many of these intergovernmental allies—including the DoD's Joint Program Executive Office for Chemical and Biologic Defense (JPEO CBD), the HHS Biomedical Advanced Research and Development Authority (BARDA), and the HHS National Institute of Allergy and Infectious Disease (NIAID)—partner with DARPA to perform advanced development after our initial investments, ensuring the scale-up and distribution of novel medical countermeasures.

Building on existing DARPA investments to accelerate the discovery of novel countermeasures, DARPA-funded researchers were responsible for discovering therapeutics—antibodies—from blood samples of recovered coronavirus patients. DARPA also partnered with advanced developers (public and private) to manufacture at scale using DNA/RNA techniques in addition to traditional cell-based biomanufacturing.

B. Extending the “Golden Hour”

When a Service member suffers a traumatic injury or acute infection, the time from event to first medical treatment is usually the single most significant factor in determining the outcome between life and death. First responders must act as quickly as possible, first to ensure a patient's survival and then to prevent permanent disability. The Department of Defense refers to this critical, initial window of time as the “golden hour,” but in many cases the opportunity to successfully intervene may be less than sixty minutes, which is why the military invests so heavily in moving casualties as rapidly as possible from the battlefield to suitable medical

facilities. However, due to the realities of combat, there are often hard limits to the availability of rapid medical transport and emergency care.

DARPA created the Biostasis program in 2018 to develop new possibilities for extending the golden hour, not by improving logistics or battlefield care, but by going after time itself, at least how the body manages it. Biostasis is attempting to address the need for additional time in continuously operating biological systems faced with catastrophic, life-threatening events. The program leverages molecular biology to control temporarily the speed at which living systems operate, and thus extend the window of time following a damaging event before a system collapses. Essentially, the concept aims to slow life to save life.

C. Serving Wounded Veterans

With a focus on wounded warriors and facilitating their return to military service, the Hand Proprioception and Touch Interfaces (HAPTIX) program is pursuing key technologies to enable precision control of and sensory feedback from sensor-equipped upper-limb prosthetic devices. If successful, the resulting system would provide users near-natural control of prosthetic hands and arms via bi-directional peripheral nerve implants. The program has a strong focus on technology transition and aims to create clinically relevant technology in support of wounded warriors suffering from single or multiple limb loss.

HAPTIX builds on prior DARPA investments in the Reliable Neural-Interface Technology (RE-NET) program, which created novel neural interface systems that overcame previous sensor reliability issues (sensors now last for the lifetime of the patient). A key focus of HAPTIX is on creating new technologies to interface permanently and continuously with the peripheral nerves in humans. HAPTIX researchers are designing technologies to tap into the motor and sensory signals of the arm to allow users to control and sense the prosthesis via the same neural signaling pathways used for intact limbs. Direct access to these natural control signals will, if successful, enable more natural, intuitive control of complex hand movements, and the addition of sensory feedback will further improve prosthetic hand functionality by enabling users to sense grip force and hand posture. Sensory feedback may also provide important psychological benefits such as improving prosthesis “embodiment” and reducing the phantom limb pain that is suffered by approximately 80 percent of amputees.

In addition to seeking to return sensation to amputees, DARPA is also aggressively investigating technical solutions to spinal cord injury (SCI), which is of significant concern to the Department of Defense. Of the 337,000 Americans with serious SCIs, approximately 44,000 are veterans, with 11,000 new injuries occurring each year. SCI is a complex condition—the injured often face lifelong paralysis and increased long-term morbidity due to factors such as sepsis and autonomic nervous system dysfunction. While considerable research efforts have been devoted toward restorative and therapeutic technologies to SCIs, significant challenges remain.

DARPA’s Bridging the Gap Plus (BG+) program aims to develop new approaches to treating SCI by integrating injury stabilization, regenerative therapy, and functional restoration. Last year, DARPA announced the award of contracts to a handful of university researchers to advance this crucial work. Multidisciplinary teams at each of these universities are tasked with developing systems of implantable, adaptive devices that aim to reduce injury effects during early phases of SCI, and potentially restore function during the later chronic phase.

3. Promoting American Innovation

One of the classic models of technology development begins with basic research that uncovers a new principle or phenomenon, which innovators then apply and develop into a new capability that enables people to do more than they could before. This model cannot account for the origin of all of the technologies DARPA has had a hand in, but it applies to many of them. Indeed, DARPA’s job is to change what’s possible—to do the fundamental research, the proof of principle, and the early stages of technology development that take “impossible” ideas through “implausible” and then to, surprisingly, “possible” or even “likely.” No other DoD agency has the mission of working on projects with such a high possibility of producing truly revolutionary new capabilities—or such a high possibility of failure. A big part of DARPA’s expertise is seeking high pay off capabilities by managing risk in ways that help keep the innovation pipeline flowing. The following are examples of the kinds of foundational efforts that promise to impact national security just like other DARPA “firsts,” including the ARPAnet, miniaturized GPS, stealth aircraft, UAVs, and monoclonal antibody therapeutics.

A. Artificial Intelligence

DARPA has been a leader in artificial intelligence since the 1960s. We played key roles in realizing the first and second waves of AI (first rule-based, then statistical-learning-based), and now we are working to realize the third wave, which can be described as contextual adaptation. To better define a path forward, DARPA announced in September 2018 a multi-year investment of over \$2 billion in new and existing programs called the “AI Next” campaign.

Currently, DARPA is pursuing more than 30 programs that are exploring ways to advance the state-of-the-art in AI, pushing beyond second-wave machine learning techniques towards contextual reasoning capabilities. In addition, more than 60 active programs are applying AI in some capacity, from agents collaborating to share electromagnetic spectrum bandwidth to detecting and patching cyber vulnerabilities.

Under the AI Next campaign, key areas being explored include automating critical DoD business processes; improving the robustness and reliability of AI systems; enhancing the security and resiliency of machine learning and AI technologies; reducing power, data, and performance inefficiencies; and pioneering the next generation of AI algorithms and applications, such as “explainability” and commonsense reasoning.

DARPA also announced a quick-turn funding mechanism called Artificial Intelligence Exploration (AIE) that allows us to quickly test the feasibility of AI concepts by rapidly developing prototypes. AIE Opportunities are released on a rolling basis from across DARPA’s portfolio, providing awards in as little as 90 days of up to \$1 million each for 18-month periods of performance. During these periods of performance, very high-risk, high-reward topics will be investigated with the goal of determining feasibility and clarifying whether the area is ready for increased investment. The ultimate goal of each AIE Opportunity is to invest in research that leads to prototype development that may result in new, game-changing AI technologies for U.S. national security. To date, we have made 141 contract awards for more than 20 AIE topics.

A representative example of DARPA’s AI Next campaign is the Assured Autonomy program, which is working to provide continual assurance of a learning enabled cyber physical system’s (LE-CPS) safety and functional correctness. The program is developing mathematically verifiable approaches and tools that can be applied to different types and applications of data-driven machine learning algorithms in an LE-CPS to enhance their autonomy and assure they are achieving an acceptable level of safety. To help ground the research objectives, the program is prioritizing challenge problems in the defense-relevant autonomous vehicle space, specifically related to air, land, and underwater platforms.

To assess the technologies in development, research teams integrated them into a small number of autonomous demonstration systems and evaluated each against various defense-relevant challenges. After 18 months of research and development on the assurance methods, tools, and learning enabled capabilities (LECs), the program is exhibiting early signs of progress.

During a recent demonstration, DARPA researchers integrated tools with an Iron Bird X-Plane simulation and a small test bed aircraft, and tested them against challenge problems relevant to ground operations, specifically assuring taxi operations on an airfield or aircraft carrier deck.

During the live aircraft exercise, the assurance methods were able to detect the presence of an obstacle during taxi, which triggered a safety that identified and executed a response route around the obstacle. The assurance methods also detected when the camera feed was being noised or obscured, kicking-in a safety method that identified and executed what it deemed the safest response—stopping the aircraft until it could safely resume operations. Additionally, the tools were able to detect anomalies that could cause their LEC to misbehave, and allowed the system to maintain safe operations despite those anomalies. Further, the use of formal models and specifications provided assurances about the system’s safety both at design and run time.

B. Microelectronics

In June 2017, DARPA announced the Electronics Resurgence Initiative (ERI) as a bold response to several technical and economic trends in the microelectronics sector. Among these trends, the rapid increase in the cost and complexity of advanced microelectronics design and manufacture is challenging a half-century of progress under Moore’s Law, which holds that the number of transistors per silicon chip doubles about every two years. Meanwhile, non-market foreign forces are working to shift the electronics innovation engine overseas, while cost-driven foundry consolidation has limited DoD access to leading-edge electronics, challenging U.S. economic and security advantages. Moreover, highly publicized challenges to the nation’s dig-

ital backbone are fostering a new appreciation for electronics security—a longtime defense concern.

Building on the tradition of other successful government-industry partnerships, ERI aims to forge forward-looking collaborations among the commercial electronics community, defense industrial base, university researchers, and the DoD to address these challenges. There is significant historical precedent to suggest the viability of this approach, as each wave of modern electronics development has benefitted from the combination of defense-funded academic research and commercial sector investment.

Given today’s cost, complexity, and security challenges, it is critical that the nation collaboratively innovate on the next generation of electronics advancement. DARPA envisions four key areas of development—3D heterogeneous integration, new materials & devices, specialized functions, and design & security—each of which have been central to ERI since its inception. Leveraging 3D heterogeneous integration, the next wave should support continuing electronics progress despite challenges to traditional silicon scaling. This integration will enable innovators to both add new materials and devices to the silicon foundation and create specialized functions precisely designed to meet the diverse needs of the commercial and defense sectors. To manage the complexity of working in three dimensions, the next wave will also demand new architectures and design tools that address rising design costs, enable rapid system upgrades, and make security integration a primary design concern. Several technological advancements developed in the DARPA CHIPS, PIPES, and HI3 programs are in transition leveraging SOTA commercial manufacturers in the OUSD(R&E) the State-of-the-art (SOTA) Heterogeneous Integrated Packaging (SHIP) program. This is a critical microelectronics performance enabler for DoD modernization priorities, including hypersonics, Artificial Intelligence, 5G, Cyber, and Space.

C. 5G Networks

Emerging 5G mobile wireless networking technologies are slated to dramatically increase in both scale and speed, enabling much faster access to data collected from billions of connected devices (60 billion nodes by 2023). This supercharged information highway is envisioned to play an important role across many industries, ranging from medicine to manufacturing. Major advances in 5G will make it easier to customize the network at a wide variety of locations. This new flexibility offers many benefits, but at the same time introduces novel security challenges. Today’s proprietary 5G technologies make it difficult to achieve the transparency necessary for security-related risk analysis and mitigation. This lack of security assurance makes it harder to deploy these technologies for defense capabilities.

In 2020, DARPA created the Open, Programmable, Secure 5G (OPS-5G) program to tackle many of the security challenges facing future wireless networks. OPS-5G is exploring the development of a portable, standards-compliant network stack for 5G mobile networks that is open source, and secure by design. The program seeks to enable a “plug-and-play” approach to various network software and hardware components, which reduces reliance on untrusted technology sources. OPS-5G will also explore the development of cost-effective SWaP-conscious cryptography with scalable security protocols. Overall, the goal of OPS-5G is to enable more secure 5G as well as future generations of networks beyond 5G.

D. Quantum Information Science

Quantum information science (QIS) includes computation, communication, and sensing technologies that exploit our understanding of quantum mechanics. Theory promises significant advances over the state of the art, with some practical successes, but much of the QIS field remains technically nascent. The successes are largely related to sensors that deliver exquisite sensitive measurements in small packages. For the DoD, this supports RF devices for radar and communications, it also enables precise stable measurement of time—useful for communication and for navigation. Much has been published on the use of quantum technology for secure communications, a technical area that saw successful DARPA investments over a decade ago. The capabilities promised by theorists for quantum computation have been more elusive. The notion of a quantum computer that can outperform conventional computers to solve useful problems is attractive, but in practice has not been possible to achieve.

DARPA is currently pursuing basic and applied QIS research. One program aims to produce small portable devices that maintain GPS-quality time and position for weeks—in the absence of GPS signals. Another program seeks to understand what may be the limits of electromagnetic sensing using clouds of atoms. Several programs explore aspects of quantum computation to determine which approach offers

the most promise for substantial practical advantage. These computation efforts include two of note: how to use a moderate number of imperfect quantum bits, while another seeks to bring rigor to the fledgling quantum computing marketplace with the introduction of insightful benchmarking. There is much valuable science that quantum-based computation may make possible in diverse fields including material science, machine learning, and biology, but it remains a DARPA-hard field in which to work.

E. Nurturing the Innovation Base

Over the past two years, DARPA's Embedded Entrepreneurship Initiative (EEI) pilot program has helped 30 pre-seed research teams raise over \$100 million in U.S. investment, spin out a dozen new companies, establish numerous joint development agreements with corporate partners, and commission multiple manufacturing facilities. In February of this year, DARPA launched an expansion of EEI with the goal of accelerating 150 DARPA-backed technologies out of the lab and into products that promise to fundamentally change the way we live, work, and fight. The initiative augments technical research teams with critical entrepreneurial expertise, top-tier commercialization mentors, and provides connections to investors. This important work delivers an effective counter to aggressive foreign investors by building stronger companies that have the ability to attract U.S. capital.

In this effort, DARPA is teaming with IQT Emerge, a new organization within In-Q-Tel (IQT) that provides entrepreneurial expertise as well as connections to early-stage U.S. investors. IQT Emerge leverages IQT's unique place at the intersection of venture capital, government, and the startup community to keep the national security community at the forefront of technology innovation.

EEI provides catalytic funding, mentorship, and investor and corporate connections for select DARPA researchers. Resources include: an average of \$250,000 in non-dilutive funding to hire a seasoned entrepreneur or business executive for one to two years with the goal of developing a robust go-to-market strategy for both defense and commercial markets; dedicated commercialization mentors with extensive private sector experience; and engagement with DARPA's private sector Transition Working Group comprising over 100 top-tier U.S. investors and corporations key to scaling and supply chain development.

DARPA-funded scientists and engineers are an invaluable resource for national competitiveness. Supporting these researchers with tailored business expertise to advance their innovations for public and military use is critical to obtain the full benefit from taxpayer funded R&D investments.

Since 2018, roughly the same time frame from the inception of EEI, DARPA has also stepped up its outreach to university researchers. Security concerns in recent years have significantly increased the barriers to university research for the DoD, and better communication of opportunities and expectations is critical to minimizing those barriers. DARPA's academic outreach initiative began in earnest with visits to a handful of public universities. During the pandemic, however, the agency was forced to change tactics and hosted a large virtual event in September 2020 called the "DARPA Vice Presidents and Chancellors of Research Summit." The Summit attracted 223 representatives from 126 schools across the nation; twenty percent of the schools had never done business with the agency. During the three-hour summit, participants learned about the agency's near-term investment priorities and how to pursue funding opportunities through existing contract vehicles.

In addition to small business and university outreach efforts currently underway, DARPA also has three formal programs aimed at supporting the next generation of researchers. The first effort is the Joint University Microelectronics Program (JUMP). JUMP is a major public/private initiative that includes several leading companies from the semiconductor and defense industries such as Intel, IBM, Micron, Analog Devices, EMD Performance Materials, ARM, Samsung, TSMC, Raytheon, Northrop Grumman, and Lockheed Martin who have tasked six research centers to undertake high-risk, high-payoff research that addresses existing and emerging challenges in microelectronic technologies. JUMP comes at an inflection point in the history of the semiconductor industry where application and system research are critical to enabling the development of superior electronic systems to meet DoD and commercial needs.

Under JUMP, the challenges of the "application-centric" research centers focus on accomplishing application-oriented goals and spurring the development of complex systems with capabilities well beyond those available today. Diving deep into cognitive computing, intelligent memory and storage, distributed computing and networking, and radio frequency (RF) to terahertz (THz) sensor and communications systems, among other areas, these research centers are developing systems that will

be transferable to military and industry in a five year timeframe and ready for field deployment in ten years.

Also, earlier this year, DARPA announced a post-doctoral fellowship program for talented young scientists, engineers, and mathematicians in the field of computer science with grants sized to support each fellow for up to two years. Participation in DARPA's new program is open to current U.S. citizens and permanent residents who have received a Ph.D. degree no earlier than June 2019 or who will have received a Ph.D. prior to the date of award, and who will be appointed to a postdoctoral position at a U.S. institution of higher education during the 2021–22 academic year.

The longest running program that DARPA has supporting university researchers is the Young Faculty Awards (YFA), which has been providing funding opportunities since 2006 as a forward-looking way to familiarize rising researchers in junior positions with national-security-relevant work within the DoD. The YFA program provides funding, mentoring, as well as industry and DoD contacts to awardees early in their careers with the long-term goal of developing the next generation of academic scientists, engineers, and mathematicians who will focus a significant portion of their career on national security issues. To date, 447 researchers from 40 states have participated in the YFA program.

CONCLUSION

From DARPA's perspective, the technological future—the endless frontier—is enormously attractive, bright with opportunities, but also fraught with unanticipated risks. For more than 60 years, the men and women of DARPA have taken very seriously their unique mission to serve the Nation by preventing—and when necessary fomenting—technological surprise.

Although I have just recently returned to DARPA, it is clear to me that we are stronger and more committed to that mission than ever. I look forward to working with the members of this subcommittee and others in the Legislative and Executive branches to ensure that the United States maintains its historic lead in the investigation and development of powerful technologies, in addition to their safe and responsible application in support of a more stable, secure, and sustainable world.

Senator TESTER. Thank you, Dr. Tompkins, for your testimony.

Because Senator Durbin has a commitment for the Memorial Service, I'm going to recognize him first.

Senator Durbin: Thank you very much, Mr. Chairman, and thank you to the witnesses who have joined us today.

I guess my opening question is not going to be specific to any area of innovation but just very generic.

If you ask the Department of Defense and previous Administrations and I'll bet in this one, as well, who are our hard targets, who are our major adversaries in the world, they would usually report four pretty obvious ones, China, Russia, North Korea, and Iran, and then if you'd ask a follow-up question, how much do each of these major adversaries spend in their annual budget for their military, you would find numbers that range from very small to still very modest in comparison to the United States.

The reason I raise this question regularly is we spend more than all of the other nations in the world on defense and security. We certainly want to be safe as a Nation, but it's our job here in this committee to ask a question, are we getting our money's worth out of this, and when it comes to innovation, I noticed, Ms. McQuiston, in your statement, as well as the statement by Dr. Tompkins, there was reference to competition with adversaries.

You would think when you consider the hundreds of billions of dollars that we spend each year, that that would hardly ever be the case. It's like a high school team regularly beating the New York Yankees. You just don't expect that to happen when you compare the resources that are being dedicated.

Can you put innovation in that context and ask whether or not our investment in innovation gives us a natural lead, an acquired lead in this competition that the budget figures belie?

Ms. MCQUISTON. I will take that answer. We're very lucky. We just started the Innovation Steering Group under Deputy Secretary Hicks, and what we're doing in innovation is looking across the DOD as transforming a lot of the processes in order to be better adaptors of technology and to more efficiently and rapidly modernize.

Our services have the burden sometimes of having the legacy systems and the newer technologies and disruptive technologies coming onboard. We're moving modernization ahead, but we can always do it better and more innovatively.

When I think of innovation, I think of two things: efficiency and effectiveness. So efficiency is doing things right and effectiveness is doing the right thing. So with the range of new technologies that can be adopted at a greater speed for us, I believe that we can come up to par and actually exceed the market and our competitors.

Senator DURBIN. So I've read some histories of DARPA, Pentagon's Brain, and books like that, very impressive, and I notice that time and again there was disruptive thinking and planning and some of it fell flat on its face but that's to be expected.

So I guess my question is as we fund things already discovered with massive amounts of taxpayers' dollars, how do you combat the fighting the last war syndrome and establishment syndrome that says we've got to keep doing more of what we've done before, and how do you get into asymmetrical thinking in an establishment as large as the Department of Defense?

Ms. MCQUISTON. The Disruptive Innovation Unit that we have under Research and Engineering has that mission entirely because they're working with the National Security Innovation Network, the National Security Capital, and bringing in market innovations and commercialized technologies. With the activities to date, they have a 189 companies now on contract. 75 percent are small business, 32 percent are first-time vendors, and 10 percent have already transitioned into military use, and that's the key, to be flexible and to work at speed, at commercial speed in order to integrate the technology rapidly into the service.

At the same time, we need to understand what the disruptive technology can mean for our advantage and also for the needs within the military, so war gaming and putting together exercises and demonstration to show what could be capable.

As DARPA can show you, a lot of times we put the needs and the requirements forward but oftentimes the newer technology is a capability that no one even concede would have been possible. So it's the merging of the future with the needs of today that actually will keep technology in the leading edge and keep us competitive with the national security and the economic security of our country.

Senator DURBIN. Thank you, Mr. Chairman.

Senator TESTER. Senator Shelby.

Senator SHELBY. Thank you, Mr. Chairman. Thank you for this hearing. I think it's very important.

As I said earlier, I don't know what we can get into that's sensitive in this open hearing today, but the Chairman has indicated that we will have a closed hearing and hope to get you back and so forth.

In the area of quantum and artificial intelligence, China and Russia, you know, we all know, are advancing their military technologies always, and increasing their defense budgets at alarming rates.

How is the department continuing to reform its processes and investment decisions to ensure that the U.S. will maintain the technical dominance necessary to deter our adversaries, and what can you speak to in this area? I don't know.

Ms. MCQUISTON. Well, there's a few things I can speak to. We have been looking at quantum from the scientific side probably at least 20 years or more, but we've had success—

Senator SHELBY. Touch on how important quantum computing is if we can ever work it all out, and it's also important to our adversaries, is it not?

Ms. MCQUISTON. Yes, actually, the future of network technology and security will greatly rely on quantum technology, and DARPA, I know, has had initiatives in this area.

I'm happy to say that a lot of them are starting to see commercialization, as well. So I think our investment in that area is starting to pay off. So I think you will actually see more activity on there.

Some of the technologies we can brief you in another venue.

Senator SHELBY. What trade-offs in the area of hypersonics are we having to make as it relates to weapon development and fielding which would come with it due to resource constraints? Are you getting what you need at DARPA for this sensitive, very important research?

Dr. TOMPKINS. Yes, sir. To the extent that I can—

Senator SHELBY. Go ahead.

Dr. TOMPKINS [continuing]. Discuss this in this hearing, the support that we have on our hypersonics program, both offensive and defensive, is adequate and we can go into more details on trade-offs in a different venue.

Senator SHELBY. Okay. In the area of space development, 2 years ago the Space Development Agency was created to accelerate the development and fielding of the next generation space capabilities.

Where we are there today and where are our adversaries?

Ms. MCQUISTON. Well, I'm happy to say for what the Space Development Agency has put together is rapidly developing new space architectures and commercial development processes in alignment with capabilities and speed.

We're integrating ground stations for advanced data links at Fort Greely, Alaska. We're working with putting forward constructive disruptors for operations at LEO (Low Earth Orbit). The first satellite demonstrations for communication are scheduled for fiscal year 2022, and working on what I would call commercial speeds, commercial launch speeds and setting up satellite operations at Grand Forks and at Redstone Arsenal.

I really do believe that speed and adaptation of spiral development and what we already see in commercial launch processes is

where we need to step up in timing for being able to put our capability up in space. So, again, if we want to talk specifics on where we are tactically in another venue, we would be happy to go into that.

Senator SHELBY. Thank you. Dr. Tompkins, in the area of cyber technology, how important is quantum computing and hopefully good research coming out of there? What will that do for us, hopefully do for us?

Dr. TOMPKINS. So in cyber technology, quantum computing offers a few different opportunity spaces.

One obviously is in the area of quantum encryption which I think has been most broadly discussed. The other, I think, is in the area of quantum computing and simulation, which then allows us to solve different kinds of optimization and sort of complexity-type problems, which would allow us to focus on analyzing, understanding, modeling, and predicting a much wider range of potential cyber behaviors and activities, and then, similarly, defending against them.

Senator SHELBY. Dr. Tompkins, one more question, if I could. In the area of hypersonics, we all know that we've got a challenge there as far as developing the hypersonic offensive weapon and also defending against it.

Where are we today, and what kind of timeframe do you think we have before we can really field what we need for the security of the country?

Dr. TOMPKINS. So DARPA has two initiatives in the defensive hypersonics arena. Details of both obviously, as you had mentioned, are going to have to go into a different session.

There is one very specifically, the Program Glide Breaker, in which we're working closely with NDA to derisk certain key aspects of the overall technology space. The timing of exactly when the transition of those technologies would go into a broader end-to-end system.

I think it's both a conversation that goes beyond just DARPA but also does require the ability to talk in a closed setting.

Senator SHELBY. Thank you. Mr. Chairman, thank you for your indulgence.

Senator TESTER. Yes. Thank you, Senator Shelby.

Ms. McQuiston, I want to touch on a couple things. I want to touch on, Number 1, our competitiveness compared to where we were 5 or 10 years ago and how you assess our success. I know you talked about war gaming, I want to get into that a little more, but let's start with our competitiveness compared to where we were. Are we ahead, behind?

Ms. MCQUISTON. I think the United States is one of the best innovators of technology overall. I think that we have some of the brightest people, the determination, the freedom, the flexible financial systems, and the determination to really succeed.

To match that with the Department of Defense, we need to have the same innovative culture as we have in our commercial industry. That's why adoption of commercial technology at the speed of which activities occur in the commercial world will be critical to more rapidly be able to gain the capabilities that the new technology and modernization will give to the military.

We are in a good position but we can always be in a much better one.

Senator TESTER. So is it fair to say, by what you've just said, that we are more competitive today than we were 5 or 10 years ago?

Ms. MCQUISTON. I believe we are, and I believe it's because we are modernizing.

Senator TESTER. Okay. And then how do you assess that competitiveness? How do you assess, you know, defining where we're at?

Ms. MCQUISTON. Well, you know, in an open session along this line, I would actually point to the vaccine technology. We've been thinking a lot about new frontiers, about challenges that the world is facing right now, and we've been thinking about them and doing things for awhile, and so surprises never come—disruptive technology never comes out of the blue.

DARPA has been our great jewel in being able to anticipate these things and start the technology ecosystem in new capabilities that have really been transformational for the United States.

Senator TESTER. Okay. So one more, and that is, innovative technologies cover a wide range, how are we prioritizing those investments, and could you give me a preview of the Administration's priorities? They may be the same answer for both questions.

Ms. MCQUISTON. At Research and Engineering, the Office of Modernization currently has 11 priorities. They fold into a lot of what is going on relative to being able to add capabilities, such as in AI (Artificial Intelligence), hypersonics, other areas of the 11 modernization techniques. Some of them will be more mature and able to have rapid adaptation. Other technologies will need more time, based on its development. That said, I do believe we can move faster to adopt those technologies.

With regards to where they stand with the Administration, the Secretary of Defense and the prioritizations, I would defer to the agency overall.

Senator TESTER. Okay. Dr. Tompkins, DARPA invented the Internet for the Department of Defense. It was adopted worldwide.

You talked about the mRNA vaccines. Are you working on any other technologies that have broader appeal beyond the Department of Defense, Dr. Tompkins?

Dr. TOMPKINS. Certainly. One example would be work that we're doing in 5G technologies for communications. So, you know, 5G is one of those areas which suffers a little bit from siloed, proprietary, vendor-driven capabilities, and so DARPA has a program called Open Co-fundable and Secure 5G, which basically seeks to create an open source 5G capability which would open up both from military perspectives and also ultimately from commercial/economic perspectives the power of 5G for a wide range of sort of dual-use capabilities.

Senator TESTER. All right. I'm going to go to Senator Moran.

Senator MORAN. Mr. Chairman, thank you very much. Thank both of our witnesses for joining us.

Let me begin by asking a question of Dr. Tompkins about cybersecurity. This has been a priority of mine and we have lots of reasons for that to be the case. It's important, but could you describe

for me how mosaics and other related cyber initiatives will not only support the department's cyber defense but the industrial partners that are critical to our Nation's security?

Dr. TOMPKINS. Certainly. So DARPA has a fairly large number of different programs focusing on cybersecurity with priorities in the areas of prevention, so things like network operations analytics, but as well as looking at topics in the area of attack attribution and graceful degradation and recovery because we do understand that as long as we are in defense, we also have to be prepared for the attack that does get through.

In those cases, they are looking not only at military systems but they translate very naturally to corporate systems. They translate to infrastructure systems, such as, you know, the power grid, water supply security, and many others.

Senator MORAN. Are those programs receiving the support they need to deploy new capabilities from the lab to the force?

Dr. TOMPKINS. Yes, sir, I do believe they are. One of the really nice things about cyber technologies, especially if they are mainly for system software, is that they transition much more naturally and much more quickly than a lot of hardware-focused technologies.

So some of these again are things we would have to discuss in a different venue, but we have excellent collaboration, particularly with organizations, like Cyber Command, where we often go into demonstrate and experimental capability and can very quickly turn it into something that transitions to their operational use in the course of a program.

Senator MORAN. Doctor, thank you very much.

Ms. McQuiston, let me follow up with what Senator Shelby was conversing with you about, hypersonics. Can you please provide an update on the industrial base partnerships that DOD has entered into to support carbon-carbon manufacturing initiatives?

Ms. MCQUISTON. Additive manufacturing for hypersonics has been key. In fact, it's been a real enabler in commercial technologies, as well. It's not only sort of the breakthrough technology for hypersonics, but it's also being used in the automotive industry to really dramatically change fuel efficiency.

I personally have not had the time to go through other agreements that we may have within the industry, but I would welcome that opportunity to come back to you with the details on that.

Senator MORAN. I'd welcome further conversations with you.

As our hypersonic batteries come online and we begin to manufacture hypersonic missiles to scale, do we have the industrial base capacity to manufacture at scale?

Ms. MCQUISTON. I believe we do. I believe that we are up for the challenge and can meet it.

Senator MORAN. So what are the challenges that we have in ramping up our production?

Ms. MCQUISTON. Well, right now, we have a roadmap as to where we're moving it for fielding and production use. It is moving ahead and I'm unaware of any specific challenge that we might have right now.

Senator MORAN. I'd appreciate additional conversation with you. Maybe we can have a meeting or—

Ms. MCQUISTON. I think in another venue we could actually get into more detail, exactly.

Senator MORAN. Thank you. Let me ask a final question, this one about space. I now co-chair the Senate's Space Force Caucus, and I'm the Ranking Member of the CJS (Commerce, Justice, Science), the NASA (National Aeronautics and Space Administration) Appropriations Subcommittee, along with Senator Shaheen.

How is your office working with commercial and government partners to make certain that satellite constellations remain secure from cyber and kinetic attacks?

Ms. MCQUISTON. That's very important to us in looking at that. In fact, recently we had used adopted commercial processes which often in the past financial institutes would use to basically open up a satellite opportunity to hack-a-sat, we called it. So you could have hackers try to break in and disrupt options of the satellite.

This has actually been a very good learning platform and to strengthen our own security within our satellite systems. So, again, adopting both commercial and putting together new technologies for defensive security operations within LEO and our satellite operations is going to be a very high priority for the Department of Defense.

Senator MORAN. Thank you. Mr. Chairman, thank you.

Senator TESTER. Thank you, Senator Moran.

Senator Baldwin.

Senator BALDWIN. Thank you, Mr. Chairman.

Our military is reliant on lithium ion batteries to power critical systems, including plant energy-intensive applications, like advanced radars and sensors. Unfortunately, we are also reliant on foreign companies, including in China, for components that go into these batteries.

We have really struggled to stand up domestic R&D capability to discover and validate new battery chemistries and technologies that would improve performance and safety and reduce costs for both military and commercial applications.

Currently, most of our innovation and resulting intellectual properties have been in Asia. On this latter point, I believe the U.S. needs to build a robust independent commercial cell development and testing capability to support advanced battery technologies needed for our military systems and commercial applications, like electric vehicles and electric grid storage.

Ms. McQuiston, I would like to hear your thoughts on how DOD can make investments to address these challenges and support next generation battery technology.

Ms. MCQUISTON. Safe uses of lithium batteries actually has been a priority for the science and the university work that we've been doing.

That said, battery technology has quite a range within the military, from the amount of batteries that need to be in the field to moving forward with high-power weapon systems.

I would say that battery technology is going to be key for micro grids that we would need at basing and forward sites. I think batteries are a priority. The science and the materials can actually move forward, I think, if we focus our energies.

DARPA is always good at looking at materials and batteries have always been a capability that they've had at modernizing and perhaps inventing new technologies and safer approaches at higher density, energy density.

Senator BALDWIN. Thank you. I've been advocating for strengthening our Buy America policies, including extending domestic content requirements down the supply chain to support the U.S. industrial base. Those efforts are critical but more focused on the acquisition side of DOD investment policy.

I also believe that we need to do more on the research, development, and innovation side, those areas, Ms. McQuiston, over which you have responsibility.

If we look at the pacing threat of China, let's say in the shipbuilding sector, DOD has reported that it has become the top ship-producing nation in the world and produces most of its critical components, like engines, weapons, and electronic systems.

The Chinese Government is investing massive sums to ensure that those components are high-performing and manufacturable at scale.

I believe that the DOD using existing authorities should provide funding to our domestic shipbuilding industrial base, particularly small- and medium-size businesses, to increase their technical capability, grow their capacity, and improve their manufacturing technology, design, and engineering processes.

Across the DOD research and engineering enterprise, what are your priorities for supporting the industrial base and what programs and investments will you make to support the technological competitiveness in manufacturing capacity of our critical defense suppliers?

Ms. MCQUISTON. Manufacturing is key to a number of technologies across the board and being able to modernize and work with manufacturing and make investments is also key to our economic security.

When you look at manufacturing, it's not only for perhaps DOD enabling capability and scale, but it's also to derisk some of the newer technologies that are required, and we have a number of manufacturing programs in this area that we're moving forward, but we are working with aspects of this from 5G and the micro electronics side straight through to materials, battery technology, as we just discussed, and moving into a program that we have at a university that's working in materials that would be supported for difficult marine environments.

So I concur with you on the need for manufacturing.

Senator BALDWIN. Thank you. Mr. Chairman, I yield back.

Senator TESTER. Thank you, Senator Baldwin.

Senator Shaheen.

Senator SHAHEEN. Thank you, Mr. Chairman, and to Ms. McQuiston and Dr. Tompkins, thank you both very much for your work and for testifying today.

I appreciate the importance of DARPA and of our investing public dollars in innovation and research for our national security, but you alluded to this, I think, earlier, Ms. McQuiston, when you talked about the private sector, and the fact is much of the innova-

tion that we benefit from comes from the private sector, is that correct?

Ms. MCQUISTON. I would say that it's quite an engine for us in innovation, absolutely.

Senator SHAHEEN. And one of the programs that has been really successful in promoting small businesses to do that kind of research is the SBIR (Small Business Innovation Research) Program. Can you speak to how important you think that is?

Ms. MCQUISTON. I think it's very important. You know, SBIRs and STTRs (Small Business Technology Transfer) have been quite an engine for us economically and moving investments forward in this area can have a great net gain in the economy, as well.

Small businesses from the investment side are 22:1 return on the DOD investment. So anything we can do to encourage and bridge the gap, so to speak, between defense needs and small business capabilities will be critical. We have a protégé program going forward with large companies so that the smaller companies can sort of be able to contribute in a way that's more meaningful to the DOD mission.

We are also looking through DIU (Defense Innovation Unit) to bring on more small businesses and non-traditional performers, to bring capability to the warfighter's mission. So I think that's a huge focus.

We have to be able to work at the speed of commercial flexibility because we don't want to just be able to understand what their technology is, we need to be able to capitalize on it and field these systems for the warfighter. So that's going to mean that we have to move at speeds that are within a commercial timeframe. So that's going to be critical in not only encouraging small business but actually being able to retain fielded systems and the support of growing our economy with small businesses.

Senator SHAHEEN. Well, thank you very much. We extended the SBIR Program or reauthorized it for 5 years back in 2017, but that means it's going to expire again in 2022.

So, Mr. Chairman, I would just say based on what we've heard and what we know is significant about the SBIR Program, we should start from now to extend/reauthorize that, and I would argue we should reauthorize it permanently. So thank you.

Can you speak to what happens when we develop innovative technologies that are then adopted by our adversaries and used to undermine the United States? How do we prevent that? What can we do to better make sure that what we're doing in innovation doesn't get pirated by our adversaries?

Ms. MCQUISTON. Well, I think securing our technology is key. We have the TAPS (Transition Assistance Program) Program, which is working to make sure that our research and development dollars are secure, looking at university funding and having transparency in an area of research that we think is critical, so that we understand other areas of funding that are coming in.

We also want to carefully work with scientists and researchers who we do not feel that there's an individual that could be a risk to the performance there, but I do believe we need to be smart and strategic about what we need to protect and keep the pace of surprise moving forward. That's the great thing about DARPA because

there's always a new frontier and there'll always be, you know, people adopting and catching up, but if we're always moving ahead, we make the process of catching up that much more difficult, though security, I think, especially at the rate of cybersecurity and really protecting our own investments, has got to be in the forefront as we move forward, but to do it smartly.

Senator SHAHEEN. Thank you. I only have a few seconds left, but I did want to ask you because you were talking about the challenge of legacy systems and innovation and how to balance phasing one out or addressing new innovative technology.

When we do that, is it usual that contracts are awarded when we've got a technology that has not been proven or tested or fielded in any way? Can you answer that?

Ms. MCQUISTON. Off the top of my head, I would say that we definitely need to make sure that we have trust in the system before it's fielded which is why we've stood up three offices between the Systems Engineering Office at SCO (Strategic Capabilities Office), DIU, with the Experimentation and Fielding, and then Emergent Technology Capability and working with that to demonstrate its capability.

But in some technologies, it can move quite rapidly. So if we're looking at evolving technologies, such as in cybersecurity, we should have a rapid pace at being able to develop, test, and field this capability rather quickly.

Obviously other technologies would take more time and testing, but we have to be flexible in how we approach the technology, which goes back to innovation, and it goes back to what I was saying in the beginning. You have to be doing the right thing and doing it correctly, but you have to adopt the flexibility in the program to account for the type of technology you're managing with the goal of fielding it as rapidly as you can.

Senator SHAHEEN. Thank you. Thank you, Mr. Chairman.

Senator TESTER. Thank you, Senator Shaheen.

Senator Hoeven.

Senator HOEVEN. Thank you, Mr. Chairman. Appreciate it. And thank you for the opportunity to meet with you today.

Secretary McQuiston, earlier you mentioned SDA, the Space Development Agency, working with Grand Forks Air Force Base. We appreciate that very much. As you know, we've worked very diligently to develop all things unmanned aviation there and obviously that whole link and the development with the satellites is incredibly important. We think we have an absolutely unique resource there. So we appreciate it and we appreciate the working relationship we have with the Space Development Agency.

We think that SDA needs to continue, to accelerate the development of technology for the warfighter. We think that's incredibly important.

So tell me, how will you ensure that SDA can provide innovative and independent support for our warfighters, even as you transition to Space Force in October of 2022, and obviously we're very concerned about supporting that effort because we think it's worthwhile but also because we think it's important. Grand Forks Air Force Base is part of that.

Ms. MCQUISTON. Yes, I believe keeping in place the spiral development process that they've put in to work at commercial speeds and to very quickly be able to field capability will be the best way to work with this development of technology for space.

I think it's already a proven pace that you see with commercial entities and I believe that what we have started right now with the Space Development Agency will prove itself by their 2-year cycle time for being able to update capabilities that we're bringing to the warfighter.

Senator HOEVEN. Good. And we appreciate very much the working relationship that we've had with you.

Is there anything that we can do at this time that you think is particularly helpful to make sure that we continue to advance this initiative?

Ms. MCQUISTON. Well, we appreciate your support for this effort and that is invaluable in itself. So thank you.

Senator HOEVEN. And same questions for Dr. Tompkins. Did you have anything that you would add?

Dr. TOMPKINS. I agree with Ms. McQuiston regarding the support and appreciation for all the support you've provided, and DARPA works very closely with the SDA specifically in developing new technologies which then derisk, you know, elements of the technology for them to deploy and we look forward to seeing the fruition of some of those efforts in the near future.

Senator HOEVEN. Good. And again we want to make sure that we continue to offer any and all assistance so that that development continues as it is. We think it's incredibly important.

Back to Ms. McQuiston. Now talk to me in terms of the next step, which is not just that communication with the satellites, but then also the communication between satellites and unmanned aviation, and again that's one of the things that we've developed in a way like no other, and obviously that's going to be an incredibly important part of this whole effort.

So talk to me about development on that second step, as well.

Ms. MCQUISTON. Yes. Looking at being able to have the battle space information, backbone in place, we have JADC2 as a program, and we also have AB2 moving forward, and looking at the information moving within the network and able to be used between ground and space will be critical. So the network and the data availability will actually be quite a platform for innovation and being able to constantly grow our capabilities at a rapid speed for the warfighter.

Senator HOEVEN. Yes. And tell me a little bit more about that interagency cooperation because one of the things we've done is we've broken down barriers. I mean, we're working with everybody. It's not just at the State and local level but all the different agencies, including NASA, Department of Defense, FAA, and everybody else.

How are you working to make sure that you're integrating all of the agencies in there, as well, in this effort?

Ms. MCQUISTON. We are working with all the agencies, and I believe the relationships are very good because everybody wants to move forward in this area. So I would say right now, we keep the pace moving forward.

Senator HOEVEN. Great. Thank you so much. And, Dr. Tompkins, anything else that you might want to add on that issue?

Dr. TOMPKINS. I completely agree with everything Ms. McQuiston has said. I think in the interest of time, I'll leave it there just with our thanks and our excitement about the future.

Senator HOEVEN. I just want to thank both of you for your innovation and your creativity and your strong leadership. We truly appreciate the working relationship. Thanks so much, and we'll continue to support your efforts in this very important area.

Ms. MCQUISTON. Thank you.

Senator TESTER. Thank you, Senator Hoeven.

Just one more question from me and then we'll close out. This is for both of the testifiers and it's been talked about with previous questions. I think it's important that we add value by tapping into academia and private sector, small business and large business.

From your guys' perspective, has there been greater participation by folks outside your agencies over the last years, has it been pretty static, or less?

Ms. MCQUISTON. I think there's been larger participation and mostly because of the outreach programs that we've put together, especially through the Defense Innovation Unit, because we're seeing a lot of non-traditional companies coming in, and we're seeing an increase of small business that are excited to work with the Defense Department and able to demonstrate their capabilities, but more is required.

Senator TESTER. Okay. Dr. Tompkins?

Dr. TOMPKINS. Yes, similarly. Of course, DARPS's funding goes entirely to those external partners. So what we would be tracking is sort of the diversification of that pro forma space and what we've looked for are organizations that have never worked with DARPA before, have never worked with the DOD, and through those kinds of outreach activities that Ms. McQuiston just mentioned, we are seeing that increase and we hope to see it even more.

To get the best ideas and to get the best capabilities we need to be reaching the broadest possible and most diverse pro forma pool possible.

Senator TESTER. Do either of you see any existing barriers to working with your particular agencies and if you do, are those barriers things that you can break down or do you need congressional help?

Ms. MCQUISTON. Well, right now at R&E, launching the Innovation Steering Group, I'm looking for areas of continual improvement and I think that we will be able to articulate sort of changes that need to take place internally in order to become more rapid in an adaptation of technology and to be more flexible in being able to do that.

Senator TESTER. So no barriers?

Ms. MCQUISTON. At this time, I would say it's a matter of rolling up our sleeves.

Senator TESTER. Okay. Dr. Tompkins?

Dr. TOMPKINS. The one thing I would suggest is that we're going to be taking a hard look at some of the sort of potential barriers for organizations that have traditionally worked with the Depart-

ment of Defense, looking at the cost of compliance, and looking at sort of the murkiness of how organizations can successfully comply.

I think this is particularly tough on smaller businesses, commercial organizations that haven't worked with Defense before, and many different classes of universities where the amount of overhead that they can afford to put in to being able to be sufficiently compliant can be really challenging and so we would be looking for ways to sort of meet them in the middle and find ways to make it easier for them to participate while still being fully compliant with our requirements.

Senator TESTER. Okay. Thank you.

Senator Shelby, do you have anything you wanted?

Senator SHELBY. I have nothing else.

Senator TESTER. Okay.

Senator SHELBY. We do look forward to some classified hearings with this group because I think it's very important.

Senator TESTER. We will make sure that our staffs together and make that happen.

I just want to express my appreciation for the testimony that was presented here today.

ADDITIONAL COMMITTEE QUESTIONS

Senators need to know that they may submit additional written questions and we would ask you to respond to them in a reasonable period of time.

[The following questions were not asked at the hearing, but were submitted to the Department for response subsequent to the hearing:]

QUESTIONS SUBMITTED TO MS. BARBARA MCQUISTON

QUESTIONS SUBMITTED BY SENATOR JEANNE SHAHEEN

Question. Ms. McQuiston, the Department has been working to improve domestic manufacturing for semiconductors and "microelectronics" through a number of initiatives, including through the National Security Technology Accelerator. At the same time, the Department has stated that is aware of the threats posed by overseas control of printed circuit board manufacturing.

Does the Department consider Printed Circuit Boards (PCBs) to be microelectronics" within the scope of existing funding authorities?

Answer. Yes, the Department considers printed circuit boards to be critical for higher level assemblies for microelectronics, but they are not addressed by the effort "access to State of the Art (SOTA) Microelectronics" in the Trusted and Assured Microelectronics program. The issues surrounding Printed Circuit Boards are industrial base related, and are being addressed by the Under Secretary for Acquisition and Sustainment in coordination with the DoD PrCB Executive Agent.

Question. How does the Department intend to encourage the reshoring of PCB manufacturing capabilities?

Answer. The Department is developing strategies for re-shoring critical microelectronics, including printed circuit board technology products with the help of the DoD Executive Agent for Printed Circuit Boards. Partnership with the interagency, especially the Department of Commerce with respect to infrastructure funding associated with the CHIPS Act, will ensure DoD unique requirements and demand are included in any execution plan.

Question. Ms. McQuiston, I understand that the Army recently awarded a fixed price Production Agreement for the Integrated Visual Augmentation System (IVAS) using Other Transaction Authority (OTA). However, this technology has not completed full testing or fielding for its night vision capabilities.

Could you describe the importance of testing and fielding for night vision technology in particular?

Answer. Fundamentally, the purpose of Test & Evaluation (T&E) is to enable the DoD to acquire systems that support the warfighter in accomplishing their mission. To that end, T&E provides engineers and decision makers with knowledge to assist in managing risks; to measure technical progress; and to characterize operational effectiveness, operational suitability, interoperability, survivability (including cybersecurity), and lethality. This is true for all technology acquisitions including for night vision technologies.

Question. How might fielding equipment that has not gone through rigorous operational testing impact the end user?

Answer. Fielding technology prior to operational testing introduces risk and potentially compromises the reliability and value of the technology fielded. Integrated testing, and the sharing of information across Developmental Test and Operational Test provides necessary data for the operational test agency to evaluate operational effectiveness, operational suitability, and overall mission capability. While IVAS did not conduct an initial operational test and evaluation (IOT&E), they did undergo an Operational Assessment. In this instance, the IVAS system milestones and fielding decisions are made by the Service Acquisition Executive, and therefore R&E would need to defer to the Army on their programmatic decisions.

QUESTIONS SUBMITTED BY SENATOR JERRY MORAN

Question. In order to achieve a multi-band/multi-orbit resilient and redundant enterprise architecture, leveraging non-LEO SATCOM assets is essential.

What are your plans, if any, to leverage Medium Earth Orbit SATCOM capabilities?

Answer. Medium Earth Orbit (MEO) SATCOM capabilities are actively leveraged from the commercial space sector via the procurement activities of the Commercial Satellite Communications Office (CSCO), at the direction of the Chief of Space Operations, United States Space Force (USSF), and in accordance with public law. USSF CSCO is the sole authority for procurement of said services for the Department of Defense (DoD) and satisfies COMSATCOM requirements on behalf of the Combatant Commands, the Services, other DoD and Federal agencies, as well as NATO and FVEY partner nations. Currently, USSF CSCO has approximately 18 MEO-based task orders awarded to the commercial space sector on behalf of DoD and others, providing SATCOM services in various geographic Areas of Responsibility.

Question. The research, development, and production of hypersonic missiles will continue to be a major strategic priority for the Department of Defense.

Can you please provide an update on the industrial base partnerships that the DoD has entered into to support carbon-carbon manufacturing initiatives?

Answer. The Department of Defense Manufacturing Technology program has engaged the carbon-carbon industrial base through multiple investment mechanisms. The Manufacturing of Carbon-Carbon Composites for Hypersonic Applications Initiative has ongoing projects to improve the automation of 2D and 3D processing of carbon-carbon materials. The Manufacturing Innovation Institute network has issued two Manufacturing Challenges to their respective networks to address additive manufacturing techniques for Hypersonic applications, high-temperature Composites, integrated computational materials engineering tools, and advanced manufacturing methods specifically for Hypersonic applications.

Additionally, the Department's Defense Production Act Title III authorities allow opportunities to invest in industrial capabilities such as carbon-carbon manufacturing. In particular, there is a request for proposals for Ultra-High and High Temperature Composite materials open now, which allows our industrial partners to be considered for funding for manufacturing initiatives.

Question. As our hypersonic batteries come online and we begin to manufacture hypersonic missiles to scale, do we have the industrial base capacity to manufacture at scale?

Answer. The Department is working with industry to rise to the challenge of producing hypersonic missiles at scale. R&E has partnered with A&S on a deep dive effort to assess the state of the current and future industrial base. This will help address current Service program needs, and pave the way to have a responsive industrial base to meet future requirements. The Department is using the results of this deep dive to inform the decisions necessary to build at scale, but a number of challenges still remain, particularly relating to supply chain management and supplier capacity. Providing a clear demand signal to our industry partners, in the form of validated requirements and steady procurement, will provide them with the confidence and business case to invest in their sub-tier suppliers and internally build capacity necessary for full scale hypersonic production.

Question. What are the challenges to ramping up production?

Answer. The challenges to ramping up hypersonic production are not unique—workforce and talent, data management, long lead production, and capacity and testing bottlenecks. However, they are exacerbated by the increased complexity of the technology and systems necessary to enable these game changing weapons that provide the Department with transformational capability. As these programs are still in development, their configuration and manufacturing processes are new competencies for industry. Some of the manufacturing processes are highly manual and labor intensive, and require specialized skills. Many need to be transitioned to industrial partners with sufficient throughput, automation, facilities, and technical understanding to produce reliably at scale.

QUESTIONS SUBMITTED TO DR. STEFANIE TOMPKINS

QUESTIONS SUBMITTED BY SENATOR RICHARD J. DURBIN

Question. Climate change is one of the top issues facing our nation, and both President Biden and Secretary Austin have made clear that we must address climate change as a national security issue—one that impacts the resilience of DoD facilities and operations. We must also invest in power and energy R&D to improve performance at our installations and optimize military capability. And this past year, the COVID-19 pandemic has made clear that we must also support research and development when it comes to public health and public agriculture, and the intersection of climate change, pests and diseases, food security, and more.

Please provide an overview of DARPA's public health and public agriculture research that can help ensure we are better prepared against a future pandemic.

Answer. DARPA is currently funding several public health and agriculture research efforts that tackle current limitations in preparation against a future pandemic. Through the Defend Against Crop System Attack program, technologies are being developed to protect staple crops, especially mature plants, that are particularly vulnerable to the most severe threats relevant to disease and climate change. The Pandemic Prevention¹ program is focusing on novel methods to accelerate medical countermeasure discovery, pre-clinical testing, and manufacturing. Pandemic Prevention will enable an integrated therapeutic development platform that leverages state-of-the-art technologies to prevent disease outbreaks. The Deployable Medical Countermeasures for Warfighter Readiness program will make nucleic acid-based medical countermeasures available to the warfighter where and when they are needed. The Preventing the Emergence of Disease (PED) program is investigating how animal pathogens are transmitted to humans and exploring novel approaches to prevent these events. The Expanding Human Resiliency program aims to maximize warfighter resiliency by leveraging the signals of the human microbiome to improve physiology. This program will develop new technologies to control and manipulate the microbiome and reduce attraction and feeding of insect vectors, such as mosquitoes, that carry disease.

DARPA received and has obligated \$113 million in CARES Act funding. These funds have been used to accelerate the development and deployment of technologies for the prevention, diagnosis and treatment of COVID-19. Activities and impacts include the following:

- Diagnostics (\$18.0M): DARPA research is producing tests that offer earlier, more sensitive, and widely distributable diagnosis of SARS-CoV-2-infected patients.
- Novel Prevention and Treatment Approaches (\$64.0M): DARPA is rapidly screening previously approved drugs using methods such as organ-on-a-chip systems and using AI and machine learning methods.
- Pharmaceutical Supply Chain (\$29 million): DARPA researchers are developing and commercializing technology that directly addresses supply chain vulnerabilities to enable an end-to-end, deployable, and scalable capability for the production of medicines made from readily available ingredients that can be sourced within the U.S.
- Environmental Monitoring (\$2 million): DARPA is developing and enabling a persistent, broad-scale screening system to detect the presence of the SARS-CoV-2 virus.

Question. We lack robust surveillance systems to identify new pests and diseases and track where they are moving. How can DARPA fix that?

¹ All programs named/cited refer to the Research and Development Descriptive Summaries (RDDS) from the Department of Defense fiscal year 2021 Budget Estimates.

Answer. DARPA focuses on developing technologies to rapidly detect and characterize threats, prevent surprise, and maintain force readiness. Several programs at DARPA focus on creating novel detection platforms for rapid identification of potential pathogens and biosurveillance of animal disease transmission. The Preventing the Emergence of Disease (PED) program is investigating how animal pathogens are transmitted to humans and exploring novel approaches to model, predict, and prevent these events. Promising intervention approaches will be developed to prevent viral species jumps from animal reservoirs to humans. Predicting such jumps is a key capability to mitigating outbreaks in human populations. The Forensic Indicators of Threat Exposure (FITE) program is developing a field-deployable resource for indicators of an individual's exposure history. This program has already supported COVID-19 Health Action Response for Marines (CHARM) by providing rapid delivery of accurate diagnostic results for Marine recruits to ensure training continuity at Parris Island. The Biology for Security (BIOSEC) program seeks to investigate novel approaches to address the DoD need for rapid detection of unknown and/or emerging biological threats by identifying pathogens based on specific behaviors, such as how they interact with and are toxic to host cells. Advances in this area will produce a completely new capability to assess the emergence of pathogens and to detect pathogens that can evade detection by traditional methods. The Gene Editing Enabled Diagnostics & Biosurveillance program will develop fieldable, low-cost gene editing based diagnostics for rapid, specific, sensitive, and multiplexed detection of biological threats in military and public health scenarios. The distributed biosurveillance device will deliver the strategic awareness needed to prevent outbreaks of known diseases, while having the flexibility to quickly detect new emergent biothreats, thereby serving as a firebreak and significantly contributing to DoD humanitarian and stabilization efforts.

QUESTIONS SUBMITTED BY SENATOR JERRY MORAN

Question. Many experts are concerned about future animal pandemics threatening U.S. agricultural systems, affecting trade, jobs and rural communities. Many areas of the world are currently facing African Swine Fever—it has now spread from Africa, to Asia and Europe. There is a strong likelihood that the virus will eventually arrive in the US, which could be devastating to pork producers and processors, as well as to corn and soybean growers who provide feed. Just as in the COVID response, we will need coordinated public private partnerships (PPP) to drive vaccine development and affordable diagnostics. We will also need to increase our surveillance capabilities including platforms to track disease threats. These tools will not only help us protect our agriculture and food producers, but will also create systems to prepare us for future biological threats that could materialize in the coming years.

For big challenges in agriculture that require urgent responses, such as protecting our agricultural and food systems from the impacts of climate change and bioterrorism, do you see the need for increased investments in agricultural research and a role for PPPs in prepare us for future pandemics?

Answer. DARPA is currently pursuing research investments that offer the ability to stabilize vulnerable coastal areas from erosion and flood-related disasters as well as identify, track, and respond to emerging agricultural threats expected to develop on faster timescales. This research should lead to developments that assist the Department of Defense in risk and vulnerability mitigation strategies related to vulnerabilities that reside in the global food system. The development of capabilities that provide early detection and identification of emerging threats and/or disruptions to the global food system will likely benefit from coordinated public private partnerships that ensure broadest dissemination and sharing of data related to global food system security.

Question. Your office is focusing heavily on technology transition projects to improve cyber defenses for the Department and its industrial partners.

Can you please describe how MOSAICS and other related cyber initiatives will not only support the Department's cyber defense, but the industrial partners that are critical to our national security?

Answer. DARPA's cyber initiatives support both the Department's cyber defense and the industrial partners that are critical to our national security.

DARPA is developing the computing, networking, and cyber security technologies required to protect and enhance systems that are essential to DoD, USG, and U.S. civil infrastructure.

Information technologies are a focus of intense computation with both peer and non-peer adversaries, and this competition will be ongoing.

Systems. DARPA programs are developing the technologies to enhance the security, resiliency, and adaptability of complex software systems. Enhanced security and resiliency are essential to meet increasingly sophisticated cyber threats. Adaptability is needed to rapidly assimilate new capabilities in an evolving operational environment. Systems with rich supply chains pose particular challenges. Our work includes not just techniques for the development of new systems, but also, importantly, techniques that can enhance security and adaptability for a wide range of existing systems.

Operations. DARPA programs explore data-intensive analytics for enterprise cyber defense, including fusion to support attribution of attacks for targeted response, new confidentiality techniques based on applied cryptography applicable to privacy and Internet Freedom, resiliency techniques to enable resilient recovery from attacks, and social engineering defense for phishing attacks. Programs also enhance the capability of cyber operators through improved data sourcing and analytics, tools and frameworks, and operator experience design, including environments for command centers.

In addition to developing information technologies, DARPA works to transition the results of its R&D to operations through applications such as the following:

- Critical Infrastructure Cybersecurity:* With regard to cyber-defense of the power grid, DARPA-developed cyber tools and a test bed were transitioned to the Department of Energy and commercial utilities under a MOA between 16th Air Force, U.S. Cyber Command, and DARPA that establishes a Joint Electric Power Range (JEPR) at Fort Carson. The JEPR will be an enduring national resource for power grid cyber resilience experimentation and development.
- Cyber Attribution:* DARPA-developed cyber analytics were used to generate timely, accurate threat information regarding malicious Russian cyber activities. This information was shared with partners at the FBI Atlanta and Pittsburgh field offices, contributing to the indictment of six GRU personnel associated with a worldwide destructive malware campaign and the remediation of that malware campaign in U.S. and allied critical infrastructure.
- Cyber Protection for Combat Vehicles:* DARPA-developed technology has been selected by the Army Combat Capabilities Development Command Ground Systems Vehicle Development Center to provide cyber protection to their Next Generation Combat Vehicle. The technology will be matured to TRL-6 for Army ground vehicle environments under this transition.
- Cyber Command and Control:* DARPA initiated the Plan X program in 2013 to develop a command and control platform for military cyber operations. Plan X technology was transitioned to the Strategic Capabilities Office in July 2019, where it was further developed under Project Ike, and has now been transitioned again, this time to the Joint Cyber Command and Control (JCC2) program management office.

SUBCOMMITTEE RECESS

Senator TESTER. The Defense Subcommittee will reconvene on Tuesday, April 20, at 9:30, for a hearing on the Defense Health Program.

With that, this subcommittee stands in recess.

Ms. MCQUISTON. Thank you.

[Whereupon, at 10:55 a.m., Tuesday, April 13, the subcommittee was recessed, to reconvene at 9:30 a.m., Tuesday, April 20.]

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 2022

TUESDAY, APRIL 20, 2021

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 9:31 a.m. in room SD-192, Dirksen Office Building, Hon. Jon Tester (chairman) presiding.

Present: Senators Tester, Baldwin, Shelby, and Boozman

DEPARTMENT OF DEFENSE

DEFENSE HEALTH PROGRAM

STATEMENT OF DR. TERRY ADIRIM, ACTING ASSISTANT SECRETARY OF DEFENSE FOR HEALTH AFFAIRS

OPENING STATEMENT OF SENATOR JON TESTER

Senator TESTER. I am going to call this committee meeting to order. I want to welcome Dr. Adirim, General Dingle, General Hogg, Admiral Gillingham for your testimony here today and especially for your service to this country. Thank you all.

Nearly 9.5 million Americans from private to general, from servicemember to spouse, from recruit to retiree depend on you for healthcare services that you oversee. Your job is a difficult one because so many people are depending on you to have the right medical professionals, and the right treatment at the right time because their lives count on it.

Over the last few years, the Department of Defense and Congress have made significant investments in our military's readiness, but there is no readiness issue more important than continuing to ensure the physical and mental health of the force.

Like our witnesses, this subcommittee is committed to doing our part to ensure that the military force we have is as healthy as possible. This means meeting the medical needs of servicemembers and their families at home and abroad.

This challenge is even more important as we are dealing with a global pandemic. I would like to know more about how the DOD is dealing with COVID, both in the terms of impact to troops and their families and whether the military healthcare system is adequately funded for this emergency.

Once again, I want to thank you for your service and for your work to better the lives of our personnel entrusted to your care. It

is an essential part of maintaining a ready force, and I look forward to your testimony.

Senator Shelby.

STATEMENT OF SENATOR RICHARD C. SHELBY

Senator SHELBY. Thank you, Mr. Chairman. Thank you for holding this hearing.

I want to, like you, welcome our witnesses today, and I want to thank them for being here today to review the Defense Health Program.

The pandemic has tested our military and its health system profoundly, and I would like to applaud the Defense Health Program's work and achievements during this extremely trying time.

Our warfighters, I believe, are our greatest defense asset, and their readiness and capabilities depend on a strong and sustainable military healthcare system. Our military's health system is responsible for providing care to 9.5 million servicemembers and their beneficiaries who deserve the best quality of care that we can provide.

In order to guarantee that standard, Mr. Chairman, we must ensure that the system is appropriately resourced, something this committee has prioritized. The military health system has undergone substantial transformation over the last several years, and I look forward to hearing about the challenges each of you have faced in this transition and how you have worked together to overcome them.

In addition to providing healthcare, our military's health system also conducts medical research on a wide variety of topics such as cancer, infectious diseases, traumatic brain injury, and burn research, just to name a few. Funding for these important research efforts has grown from \$210 million in 1992 to nearly \$1.5 billion last year. That is a substantial investment and I believe one that does not take into account the billions of dollars that we also provide annually to the National Institutes of Health to conduct research in many of the same areas.

What is more, the President's budget request proposes to create the Advanced Research Projects Agency for Health at NIH (National Institutes of Health). This new \$6.5 billion federally funded research agency will focus on cancer research and other diseases such as diabetes and Alzheimer's. With all this seeming duplication of research dollars, I question at times whether DOD's (Department of Defense) medical research investments are truly focused on addressing our warfighters' health and readiness concerns or simply investing in scarce defense resources and medical research that is also underway at NIH.

So, while we can all agree that this research is necessary, I hope our witnesses can provide a clear explanation regarding defense medical research dollars, what they are doing that NIH funding cannot or is not doing. In other words, is there duplication here, and if so, how do we get away from it?

Thank you for holding this hearing, Mr. Chairman.

Senator TESTER. Thank you, Senator Shelby.

Now we will go to opening statements. I would ask that each of you limit your opening statement to 5 minutes each. Your entire

written statement will be put in the record, and we will start with you, Dr. Adirim. You have the floor.

SUMMARY STATEMENT OF DR. TERRY ADIRIM

Dr. ADIRIM. Good morning. Chairman Tester, Vice Chairman Shelby, distinguished members of the subcommittee, I am honored to represent the military and civilian medical professionals in the Military Health System who are serving around the world and here at home, delivering healthcare in support of our 9.6 million beneficiaries as well as support to millions of Americans throughout the United States.

My testimony will provide the subcommittee with information on major activities that will inform our budget proposal for the coming fiscal year. The most significant issue looming over all of our projections is the national response to the COVID-19 pandemic.

Secretary Austin has made clear that the greatest proximate challenge to our Nation's security is the threat of COVID-19. The Department has, and will continue to, act boldly and quickly to support Federal Government efforts to defeat this disease.

My written testimony provides a comprehensive review of the critical health support the Military Health System is providing worldwide in support of our primary mission and as part of the whole-of-government response to the COVID crisis.

We remain deeply appreciative of the fiscal year 2020 supplemental appropriation of \$2.2 billion as part of the CARES Act that covered the significant costs incurred during the initial months of the response.

In fiscal year 2021, however, costs attributable to the pandemic continue to accumulate. As of March 31, 2021, our midyear review of the Defense Health Program identified likely shortfalls as part of the ongoing pandemic response projected at over \$1.8 billion, \$1 billion of which is private-sector costs.

In addition, the financial impact of our military support to the FEMA (Federal Emergency Management Agency) missions, which remains ongoing, are still being assessed. We are working within the Department to try and mitigate these shortfalls that are challenging.

The Department continues to focus on internal business process improvements to find greater efficiencies and remains vigilant about variation in year-to-year expenditures. We are appreciative that Congress continues to grant the Department carryover authority each year. We are also grateful for this committee's long-term advocacy and support for our military medical research program. Military medical research advances the state of medical science in those areas of most pressing need and relevance to today's emerging threats, which includes the COVID pandemic.

When released, our fiscal year 2022 budget will present a balanced, comprehensive strategy that aligns with the Secretary's priorities to include the ongoing response to the pandemic. We look forward to working with you over the coming months to further refine and articulate our objectives in a manner that improves value for everyone: our warfighters, our combatant commanders, our patients, our medical force, and the American taxpayer.

Thank you for inviting me here today to speak with you about military medicine, our response to the global pandemic, the essential integration between readiness and health, and about our plans to further improve our health system in support of the National Defense Strategy on behalf of our uniform servicemembers and the families we serve.

Thank you.

[The statement follows:]

PREPARED STATEMENT OF DR. TERRY ADIRIM, MD, MPH, MBA

Chairman Tester, Vice Chairman Shelby, distinguished Members of the Subcommittee, I am pleased to represent the Office of the Secretary of Defense to discuss the Defense Health Program (DHP) and its contributions to the health affairs of the Department. I am honored to represent the dedicated military and civilian medical professionals in the Military Health System (MHS), which provides direct support to our combatant commanders and delivers health care for our 9.6 million beneficiaries.

This hearing is occurring in advance of the formal release of the President's FY22 full budget. My testimony will provide the Subcommittee with information on major activities that will inform our budget proposal for FY22 as well as issues affecting FY21 execution. The most significant issue, looming over all of our projections, is the national response to the COVID-19 pandemic. Our national success in reducing the spread of the virus, and vaccinating our population, will affect every aspect of our health care costs. For that reason, my testimony will begin with the current state of the DoD response to COVID-19.

COVID-19 RESPONSE

The past fourteen months have represented a unique and challenging period for our Nation as we've confronted and responded to the COVID-19 pandemic. In line with the President's priorities, Secretary Austin has made clear that the greatest proximate challenge to our Nation's security is the threat of COVID-19. The Department has, and will continue to, act boldly and quickly to support Federal government efforts to defeat this disease. The MHS is providing critical health support worldwide to our military forces, supporting other Federal and state entities as part of a whole-of-government response to this crisis, and continuing to meet other strategic, global mission requirements, while sustaining high quality health services to our military Service members and their families.

Beginning with the declaration of a global pandemic in March 2020, the MHS provided essential crisis response services in support of military leaders and civilian demands. Though this summary is not all-inclusive, I will briefly mention several critical initiatives that contributed to the national response and also generated additional expenditures for the Department.

Surveillance and Laboratory Testing. Soon after the pandemic began, the Secretary of Defense established the DoD Coronavirus Task Force that included a Diagnostics and Testing Line of Effort. The Department grew its laboratory testing capacity from 16 operational laboratories in late March 2020 to 189 operational laboratories by March 2021, and increased on-hand SARS-COV-2 tests from approximately 200,000 to over 1.8 million. To date, the Department has conducted well over 3 million tests and has tests on-hand to conduct more than 100K tests per week. Testing is a key public health intervention that has helped to limit the spread of SARS-COV-2 within the military. Coupled with other public health measures like social distancing and masking, military installations have consistently lower positivity rates than their surrounding communities.

Even as vaccination efforts continue to increase, testing will remain a key pillar of our public health strategy to battle this disease and maintain a ready force. Screening through antigen and PCR testing using a variety of testing strategies in a post-vaccination environment will continue as part of the Department's COVID-19 risk mitigation strategy to drive cases down toward zero. The Department is also committed to whole genome sequencing and identification of variants of concern and interest and to understanding their prevalence among our Service members and other beneficiaries. The Department has already committed the resources and funding to more than double the number of specimens the Department can sequence and analyze each week.

Clinical Support for Treatment and Therapeutics. Early in the COVID response, the Defense Health Agency (DHA) developed and released the first DoD COVID-

19 Practice Management Guide (PMG) to provide clinicians and Military Treatment Facilities (MTFs)—our military clinics and hospitals—with a single document on best practices informed by the latest evidence, and guidance across all clinical care specialties. The PMG has been continually updated and rereleased, with the most recent version (Version 7) published in March 2021. The DHA also established a Joint Registry for COVID-19. Using the Joint Trauma Registry as a foundation for this effort, the COVID Registry collects and assesses clinical information on COVID patients, in order to inform our military medical community on the rapidly evolving science behind this disease. In April 2020, DHA also put forth the Health Protection Condition (HPCON) Guidance in a COVID-19 Environment, which contained CDC informed guidance to support MTFs in healthcare delivery in response to COVID-19, based on the locally-determined risk level.

In June 2020, DHA began an effort to collect donated units of plasma from patients who had fully recovered from COVID-19 to support development of an effective treatment against the disease. Again, the DHA relied on the COVID-19 registry to identify potential donors, as well as capture the use of, and outcomes from, convalescent plasma on hospitalized COVID patients. In August 2020, after receiving Emergency Use Authorization (EUA) from FDA, COVID-19 convalescent plasma was made available to MTFs for investigational treatment of COVID-positive patients who met established criteria in accordance with approved protocols.

The MHS worked closely to implement other, FDA-approved treatments for COVID. In September 2020, shortly after Veklury® (remdesivir; first FDA-approved treatment for COVID-19) received an expanded EUA, the medication was rapidly pre-positioned throughout DoD to ensure availability to hospitalized patients with suspected or laboratory-confirmed COVID-19, irrespective of their severity of disease. Similarly, in November 2020, after receiving an EUA from FDA for COVID-19 monoclonal antibody treatment, DHA developed and disseminated specialized guidance to assist MTFs and healthcare providers regarding patient care considerations when administering this treatment for mild and moderate cases.

Individual Medical Readiness. COVID-19 did affect medical readiness within the military. The Department uses a concept called Individual Medical Readiness (IMR) to measure medical readiness, which consists of six elements. These are Dental Readiness, Immunizations, Medical Readiness Labs, Deployment-Limiting Medical Condition (DLMC) Status, Periodic Health Assessment (PHA), and Individual Medical Equipment. In 2015, the DoD Total Force Medically Ready (TFMR) goal was set at 85%. Since 2015, the Total Force has consistently met or exceeded the 85% goal. With COVID-19 pandemic beginning in the 2nd quarter of 2020, TFMR decreased below the Department's 85% goal. As of the 4th Quarter of Calendar Year 2020, TFMR compliance was 82.2%; Active Component IMR compliance was 82.4% and Reserve Component IMR compliance was 81.7%.

The COVID-19 pandemic most affected Dental Readiness and Immunizations. These IMR requirements can only be completed via in-person clinic visits. Of note, throughout the pandemic, medical readiness for deploying Service Members was prioritized and all personnel are required to be fully medically ready prior to deployment. Capabilities such as virtual and telephonic medical appointments allowed MTFs to continue to provide access to medical readiness support services. We expect IMR rates to quickly recover and return to pre-COVID levels as our vaccination campaign proceeds through spring and summer 2021.

Healthcare Delivery and Deferred Medical Care. In both the direct care system and the TRICARE network, the Department has worked to ensure beneficiaries receive medically necessary and readiness-related care throughout the pandemic and we are currently working to address delayed or deferred care. In addition to guidance for MTFs on standard processes to provide medically necessary care that could not be delayed, the Department significantly expanded the use of Virtual Health (VH) to meet beneficiary demand while minimizing unnecessary risks for patients and staff.

MTFs and Markets are increasing the number of available appointments to meet patient demand for care and schedule previously delayed care. Despite additional workload associated with COVID-related deployments and vaccinations, MTF appointment availability is approaching pre-pandemic levels and access to appointments for routine and follow-up care averages 4.8 days, which is better than the standard of 7.0 days or fewer. Likewise, specialty referrals are up from spring 2020 levels and are approaching pre-pandemic rates. While direct care performance on cancer and other preventive screening is lagging compared to strong pre-pandemic performance, MTF staff members are actively reaching out to beneficiaries to encourage and facilitate screening appointments.

For network care, DHA worked with the managed care support contractors to develop strategies to ensure our beneficiaries' ability to access care in the network, en-

sured resources were monitored to confirm provider availability, expanded availability of VH and eased beneficiary access to providers by extending referral and authorization limits and adjusting rules impacting beneficiary cost shares.

Public Health Planning. The COVID-19 pandemic has highlighted the importance of integrated DoD and interagency public health planning, which includes conducting realistic exercises with federal, state and local public health partners. However, the MHS pivoted quickly and effectively in responding to the pandemic across a wide range of requirements, both internal to DoD and across the public health universe. In the process, we learned lessons and developed associated recommendations that can have an immediate and sustained impact on the ability of the MHS to support the ongoing pandemic and to prepare for future major public health emergencies. Chief among these actions is developing even tighter integrated coordination with interagency partners such as the National Institute of Health, the Centers for Disease Control and Prevention, the Federal Emergency Management Agency and other organizations regarding global medical surveillance of cases and variants of concern. As a primary partner in the interagency scientific community, DoD shares genetic sequencing, seroprevalence information and other relevant surveillance data with interagency partners.

Medical Education & Training. The collaborative leadership efforts of the Medical Enlisted Training Campus and the Services resulted in minimal disruptions in training by maximizing the interoperability and capabilities of alternative learning modalities and technology adoption. The MHS kept graduation rates on target, and the end-strength of enlisted medical career fields healthy and ready to support Combatant Commanders. Additionally, the MHS expanded support for continuing education credits (CE) for 16 healthcare specialties and awarded over 90 thousand continuing education/medical credits. Continuing education credits are required for health professional licensure and certifications. The Defense Medical Modeling and Simulation Office recognized an opportunity to provide immediate support in meeting COVID-19 related simulation training gaps/needs of the transitioned Markets and associated Military Medical Treatment Facilities.

COVID-19 Vaccine and Immunization Implementation. Since December 2020, the Department introduced a global immunization campaign to deliver expanding supplies of vaccines approved for use under an EUA. In December 2020, DHA issued a DHA Interim Procedures Memorandum to implement instructions, assign responsibilities, and prescribe procedures for the COVID-19 Vaccination Program. DHA continues to issue updates on the coordinated strategy for prioritizing, distributing, and administering the COVID-19 vaccine, with the most recent DoD Vaccination Plan modification (MOD-12) released in April 2021.

As of April 16, 2021, the Department had administered over 2.5 million doses of the three vaccines authorized by the FDA under an EUA. However, on April 14th, DoD implemented the CDC and FDA recommendation to pause administration of the Johnson & Johnson vaccine until federal health experts conclude their review of the rare, severe adverse events that have occurred in a small number of individuals. Although DoD was distributing all of its Johnson & Johnson vaccine to overseas locations, the Moderna vaccine still represented the majority of our overseas allocation. If this pause extends beyond several weeks, DoD will consider adjusting its current allocations to accommodate our overseas requirements.

Adapted from the CDC tiered framework for prioritizing individuals for vaccination, the DoD population schema includes persons in critical national security positions and deploying forces in the Tier 1 priorities. Vaccinations are being administered at 350 DoD sites around the world, in addition to access to civilian sources for our beneficiaries. On April 19, 2021, the Department fully opened vaccine appointments to all eligible individuals, consistent with the President's direction to all jurisdictions.

The vaccine remains voluntary for all eligible persons to include active duty Service members. The Department has implemented a comprehensive outreach and communications effort to encourage all eligible persons seek out these highly safe and effective vaccines. We are encouraged by the trends in vaccine acceptance, and are confident that all individuals over the age of 15 who want the vaccine will be fully vaccinated by mid-Summer.

Defense Support to Civilian Authorities. In addition to the comprehensive response in support of the military mission, the Defense Department has provided significant expertise, logistics support, and personnel to civilian communities. Early in the pandemic, the DHA coordinated the delivery of critical inventory from existing strategic reserves to the Department of Health and Human Services for redistribution to civilian communities. This support included delivery of five million N-95 masks and over two thousand ventilators. The US Navy deployed the USNS Comfort and USNS Mercy to civilian ports on the east and west coasts to provide hospital bed surge

capacity for cities in crisis. Throughout 2020, Army, Navy and Air Force personnel deployed as units to civilian hospitals around the country to augment local staff. Military medical personnel took on key positions with Operation Warp Speed, and infectious disease experts and medical researchers from DoD medical research and development offices collaborated closely with the broader American medical research community.

COVID-19 After Action Review (AAR). The MHS is a learning organization, and we are committed to continuously improving our performance—whether in battlefield medicine, health care quality and safety, or our COVID response efforts. Consistent with the FY21 NDAA, Section 731, the MHS established a rigorous AAR process, led by the Uniformed Services University of the Health Sciences. This AAR builds on the MHS interim AAR process and report established by the ASD(HA) in May 2020 and completed in January 2021. The Department will submit a substantive, interim report to Congress under Section 731 by 1 June, and submit a final report by the close of 2021.

Effects on the FY21 Budget. We remain deeply appreciative of the FY20 supplemental appropriation of \$2.2 billion, as part of the CARES Act, that covered the significant costs incurred during our initial response.

In FY21, however, costs attributable to the pandemic response continue to accumulate. As of March 31, 2021, our mid-year review of the Defense Health Program (DHP) identified likely shortfalls as part of the ongoing pandemic response, which we are working with the Department to resolve. In addition, the financial impact of our military support to the Federal Emergency Management Agency (FEMA) missions, which remain ongoing, continue to be assessed. The most significant cost drivers include higher than projected Private Sector Care costs; additional laboratory testing; personal protective equipment (PPE) expenditures; and numerous other requirements from public health surveillance to antiseptic cleaning of medical facilities.

While there are opportunities to realign funds to meet the operational imperative of the pandemic response, actions will still create additional risk and financial liability at a later date.

MHS REFORMS AND TRANSITION

The FY 2017 National Defense Authorization Act (NDAA) enacted sweeping reforms to the organization and management of military medicine. The over-arching direction from Congress was to centralize and standardize many military health care functions in a way that better integrates readiness and health delivery throughout the Department. Included among these reforms: the expanded authority and responsibility of the DHA to manage MTFs worldwide; and the authority to adjust medical infrastructure in the MHS to maintain readiness and core competencies of health care providers.

Following a strategic pause in transition activities due to the initial COVID-19 pandemic response, which was directed and then lifted by the Secretary of Defense in April and November 2020 respectively, the MHS has continued executing the transition of Military Medical Treatment Facilities (MTF) to DHA management in accordance with the Department's approved, conditions-based execution plan that meets the intent of Section 702 of the FY17 NDAA.

In the coming weeks, we expect to certify all Wave 1 Market Offices (i.e., San Antonio, Tidewater, Colorado, Puget Sound, and Hawaii). These critical markets account for 34 percent of the MHS' dispositions, 48 percent of the MHS's direct care expenditures, and 11 percent of the MHS's purchased care expenditures—providing tremendous opportunities for continued standardization and optimization. Wave 2 Market Establishment planning is underway, and we plan to institute an intermediate headquarters to manage the remainder of our small hospitals and clinics in early June. There are still outstanding personnel transfer issues to resolve, however, that place at risk our ability to complete this transition by the congressionally established deadline of September 30, 2021.

Section 703 of the FY2016 NDAA directed the Secretary of Defense to submit to the congressional defense committees an implementation plan to restructure or realign military medical treatment facilities. This report was transmitted to Congress on February 19, 2020. The report articulated the DoD's decisions to align MTFs to increase the readiness of our operational and medical forces and achieve a proper balance between meeting readiness requirements and managing the total cost of health care in the direct and purchased care systems.

All restructuring efforts were paused on April 2, 2020 as a result of the resources required to respond to the COVID-19 pandemic. The Department is revalidating the assumptions made regarding its readiness requirements prior to the pandemic, as

well as the assessment of network capacity to absorb additional patients where we intend to proceed with right-sizing plans. The DHA will take a conditions-based approach to any transition of medical services. In other words, transition will only occur when we are certain that local TRICARE networks can provide timely and quality access to health care. If they cannot, we will revise our plans.

MHS GENESIS IMPLEMENTATION

The Department continues to proceed with the multi-year implementation of its new, Electronic Health Record (EHR), MHS GENESIS. Although we paused a number of specific, in-person activities during the COVID-19 response, we still delivered the two Waves scheduled for completion in 2020, two currently in 2021, and remain on schedule for enterprise completion in 2023. As of today, MHS GENESIS supports the delivery of safe, high-quality data to patients and providers across 20 MTFs.

The value of MHS GENESIS has become even more apparent during the COVID-19 response. We were able to implement COVID-specific configuration changes in MHS GENESIS within hours on several occasions that provided senior military and civilian leaders with timely information on COVID laboratory testing results and the health of our force and our beneficiaries; the same changes in our legacy systems took nearly four weeks to implement.

MHS GENESIS' mass vaccination capabilities have produced a significant improved workflow that allows the Military Departments to assess the status of service member inoculations in order to ensure readiness. For example, medical personnel at Twentynine Palms, California successfully screened 700 active duty Marine records within days of going live with MHS GENESIS in September. The process was so successful that Cerner made the solution part of its baseline product for commercial use.

DoD and VA continue to closely collaborate on a fully integrated EHR with the oversight of the Federal Electronic Health Record Modernization (FEHRM) office. The Departments collaborated with the FEHRM to launch the joint health information exchange (joint HIE) in April 2020, creating a single common gateway through which DOD and VA providers can send data to and retrieve data from participating private sector partners. With the FEHRM's leadership, the Departments support a Federal Enclave providing a single, common record with high cybersecurity standards, joint configuration boards to ensure standardized workflows, and shared risks, schedules and lessons learned.

TRICARE 5TH GENERATION CONTRACTS (T-5)

The Department continues to manage the TRICARE Program in a manner that seeks to reduce the growth in health care costs while ensuring our health benefit remains an exceptional tool for recruitment and retention of military personnel and their families. Among the most important strategies we pursue is the development of effective TRICARE contracts that deliver high-value, patient-centric care designed to seamlessly integrate military and private sector care in support of readiness and health outcomes.

The T-5 contracts represent the next generation of contracts that provide DHA with the flexibility to adjust network requirements, improve professional services support, and adapt care delivery models in support of evolving mission requirements and changes in American health care delivery. After an extensive, multi-year engagement with Department leaders, industry, and other stakeholders, as well as three draft Requests for Proposal (RFPs) shared with industry, the Department issued the T-5 RFP on April 9, 2021. The goals of this procurement support (1) military medical readiness and the readiness of the medical force; (2) beneficiary choice; (3) high value care; and the adoption of Industry Business Standards.

The Department looks forward to healthy competition from industry and the inclusion of new health care delivery models in the coming proposals. As part of the T-5 process, the Department will conduct "Competitive Demonstrations" during the contract's period of performance. Twenty-one potential markets are identified in geographic areas where MTFs may rightsize, downsize or where DHA provides TRICARE Prime but no MTF exists. The RFP also specifies three innovations: Virtual Value Networks, Advanced Primary Care, and Care Collaboration Tools that will start with T-5 initiation and up to seven other demonstrations are planned during the life of the contract. DHA anticipates receipt of offeror proposals no later than August 13, 2021. The new contracts are planned to begin health care delivery in Calendar Year 2024.

MEDICAL RESEARCH AND DEVELOPMENT

The Department is grateful for the long-term advocacy and support for its military medical research program. The DHP research, development, test, and evaluation (RDT&E) focus is to advance the state of medical science in those areas of most pressing need and relevance to today's emerging threats, which includes the COVID-19 pandemic.

We seek to discover and explore innovative approaches to protect and support the readiness, health, and welfare of military personnel; to accelerate the transition of medical technologies to development and acquisition; and to accelerate the translation of advances in knowledge into new standards of care and treatment that can be applied in the field or in military medical treatment facilities.

In the coming years, we hope to leverage new technologies to include artificial intelligence and machine learning, biotechnology, and autonomous systems. The goal is to accelerate the transition of medical technologies to development and acquisition programs, and to further the translation of new standards of care to support and treatment that can be applied in the field or in military medical treatment facilities. We will seek to mitigate deployment-limiting medical conditions for service members by focusing on injury prevention and rehabilitation.

The MHS continue to employ and strengthen our enterprise-wide performance management systems that provide stakeholders—both medical and line leadership—at all levels of the military with visibility into how we are performing on key metrics. These dashboards show longitudinal performance in measures of readiness, health, access, quality, safety and cost. We monitor critical indicators of quality and safety—that point us toward high reliability as a system of care. Access to primary care and specialty care are measured along with patient satisfaction to ensure we are meeting patient expectations. We have provided Department leadership, MTF commanders and staff with visibility into COVID-19 specific measures that include, but are not limited to operational hospital bed capacity and surge capabilities, timely laboratory test results, PPE inventories, COVID-19 vaccine target population and vaccine administration data, as well as important private sector care data.

Our dashboards can be viewed at an enterprise level, by Service, by market, and by individual hospital or clinic. We will continue to adapt this management system as the MTF transition progresses. Commanders can assess their performance against expected benchmarks, against peer institutions, and—where possible—against civilian sector performance as well. These dashboards help us to both assess how we are doing in these areas, and where we need to invest resources, training, or management attention in order to achieve further improvement.

OTHER SIGNIFICANT HEALTH INITIATIVES

There are several other health initiatives that merit comment—chief among these is access to timely, high quality mental health services and related activities to reduce the incidence of suicide among our service members, their families, and all beneficiaries. The Department is committed to the health, welfare and safety of our service members and families and we have undertaken a broad-based campaign encouraging service members to seek mental health treatment when signs or symptoms occur, help service members and their families to identify those signs and symptoms, and to de-stigmatize mental health care overall.

The DoD has invested in a number of programs to increase access to mental health care for Service members who are experiencing symptoms of a psychological health condition. Service members are eligible to receive free, comprehensive behavioral health care (including clinical assessment, psychotherapy, and psychiatric treatment) at their local military medical treatment facilities. We also have programs that embed psychological health providers in operational units to assist Service members in their everyday work environments. The primary care medical homes provide follow-up when Service members disclose psychological health concerns to their primary care provider. Military OneSource is our 24/7 resource to connect Service members to information about their psychological health, non-medical counseling for stress management, and referrals to healthcare providers.

We have witnessed significant improvements in destigmatization and increased use of behavioral health services. Nonetheless, suicide rates remain unacceptably high. Suicide is a very complex issue with many biological, social, and psychological factors that contribute to suicide. In recognition of this complexity, the DoD implements a comprehensive public health approach to suicide prevention and intervention. The DoD is focused on using every available resource to support our Service members.

For example Service members are screened for symptoms of psychological health conditions throughout their service. All Service members who are deployed in con-

nection with a contingency operation receive a series of deployment health screenings designed to identify psychological health concerns, including posttraumatic stress disorder (PTSD) that may require referral for additional care and treatment. Additionally, all Service members, regardless of deployment status, receive a mental health assessment upon separation from military service to ensure documentation of any psychological health conditions and arrange for appropriate follow-up.

Currently the DoD and VA are working together in the development of a single Separation Health Assessment that will include a Mental Health Assessment. This effort will make the separation process more efficient and improve the mental health care of our Service members. Clinical Practice Guidelines have been formulated for all major clinical conditions in mental health, and Joint VA/DoD Clinical Practice Guidelines (CPGs) for mental health care facilitate delivery of evidence-based mental health care practices and strengthen the ability to maintain mental health readiness.

Beyond individual approaches, the public health approach also includes broader efforts, such as those targeted for our populations of greatest concern (young and enlisted Service members) and developing initiatives to support military families. For example, current efforts include interactive educational pilot programs to teach foundational skills to effectively deal with life stressors and to address help-seeking concerns and encourage use of support resources.

The Department continues to promote initiatives that increase awareness of risk factors for suicide, safe storage of lethal means (e.g., firearms and medications), and communicate how to intervene in a crisis. For example, DoD trained more than 2,000 non-medical military providers to provide Counseling on Access to Lethal Means (CALM) to Service members and families to increase awareness of risk factors for suicide, safe storage of lethal means (e.g., firearms, medications, and other lethal means), and how to intervene in a crisis. DoD is expanding on this pilot program for other influencers, such as spouses.

OVERALL FY22 BUDGET

The soon-to-be released budget will prioritize our resource requirements to address the COVID-19 pandemic and also address health care delivery challenges caused by the pandemic.

The Defense Health Program funding level that will be proposed by the Department in the FY 2022 President's Budget re-baselines health care program resources based on FY 2020 execution prior to the onset of COVID. Some residual risks remain, such as the COVID-related effects of previously delayed care that may return, potentially deleterious impacts on beneficiaries' health due to delaying or forgoing care, unrecognized impacts of COVID-19 among asymptomatic or long-term, persistent disease, and the inherent uncertainty in predicting healthcare costs.

The MHS is not unique in the variability associated with predicting health care costs as all health insurers face these same challenges when forecasting their health expenditures for a given year. Changes in medical practice, demand for services, and new procedures and drugs are hard to predict. COVID has only exacerbated these challenges.

It is important to consider the FY22 budget request in the context of MHS cost control for the last ten years. Over the period of FY 2012 to FY 2018, both private health insurance premiums and National Health Expenditures per capita rose 25% (or 3.7% annually). However, the Department, working with Congress, instituted a series of initiatives that reduced DoD costs well below the rate of civilian growth. A combination of benefit changes, payment savings initiatives, contract changes, and population reductions masked underlying increases in health care costs. Starting in FY 2019, cost patterns returned to normal growth until the COVID pandemic significantly reduced the utilization of health care services beginning in March 2020.

The Department continues to pursue efforts focused on internal business process improvements and structural changes to find greater efficiencies, such as further integrating and standardizing the operation of hospitals and clinics; continuing the deployment of MHS GENESIS; modernizing clinical and business processes; and, streamlining internal operations. The Department is not requesting any additional changes to beneficiary cost-sharing in the FY22 budget.

The Department remains vigilant about variation in year-to-year expenditures, and we are appreciative that Congress continues to grant the Department carryover authority each year. Carryover authority allows DoD to maintain better funding flows to minimize disruption of health care services to our beneficiaries. We are committed to making our health care cost projections even more transparent in the year of execution, providing regular updates to the committee, and providing full

visibility to Congress on potential plans for reprogramming funds within the fiscal year should that possibility unfold. Furthermore, we will ensure that available funding is directed toward unfunded medical readiness and health care delivery requirements. Carryover authority is an invaluable tool that provides the Department with needed flexibility to manage issues that emerge during the year of budget execution.

When released, our FY22 budget will present a balanced, comprehensive strategy that aligns with the Secretary's priorities, to include the ongoing response to the COVID-19 pandemic, and continues to fulfill our requirements associated with our congressionally directed transition. We look forward to working with you over the coming months to further refine and articulate our objectives in a manner that improves value for everyone—our warfighters, our combatant commanders, our patients, our medical force, and the American taxpayer.

Thank you for inviting me here today to speak with you about military medicine and our response to the global pandemic, the essential integration between readiness and health, and about our plans to further improve our health system in support of the National Defense Strategy and for our beneficiary population.

Senator TESTER. Thank you, Dr. Adirim.
General Dingle.

STATEMENT OF LIEUTENANT GENERAL R. SCOTT DINGLE, SURGEON GENERAL, DEPARTMENT OF THE ARMY

General DINGLE. Chairman Tester, Vice Chair Shelby, and distinguished members of the subcommittee. Thank you for your support and for the honor to speak to you on behalf of over 83,000 active-duty Guard and Reserve Army soldier medics.

COVID-19 and unexpected challenges to our national security attempted to attack the foundation of our Nation, but it did not disrupt the fabric of our Constitution and its Army's response to it.

I honor the soldiers that I am privileged to lead. As General McConville, our 40th Chief of Staff of the Army, states, "People first and winning matters." I am proud to say that our Army is ready to win. Within days of our Nation's call, we collaborated with Health and Human Services, the Department of Homeland Security, and our State governments. We expanded critical testing capacity, inculcated retiree recalls, deployed vaccine and medical teams in support of civilian entities, and partnered with medical research and development in support of the whole-of-government approach.

Soldiers deployed to three countries, 19 States, and three territories, to include California, Illinois, North Dakota, Washington, and Wisconsin to support and to save American lives. You called, we were ready, we responded.

My vision for Army Medicine is clear. We will be ready, reformed, reorganized, responsive, and relevant in this era of unprecedented global complexity whether in support of our National Defense Strategy and whenever our government calls. So, when the Army deploys today and fights tonight, Army Medicine will be right there to return our soldiers to duty tomorrow. From the foxhole to the fixed facility, we will conserve the health and fitness of the fighting force and reinforce our readiness requirements through healthcare acuity for our beneficiaries.

I will ensure that integrated medical efforts occur with strong fiscal stewardship and partnership between Army Medicine, the Joint Force, and the Defense Health Agency ensuring the readiness of our soldiers. The vision and operational focus for Army Medicine remains at building readiness and properly manned and proficiently trained units and modernizing to remain ready and rel-

evant for future conflicts and challenged. Medical reform directors will be implemented to maximize readiness in support of the Army mission.

Finally, we are committed to sustaining and improving our partnerships, foreign and domestic, to elevate battlefield interoperability, and to support our National Defense Strategy.

In closing, I thank the committee for your long-standing support to the Army and military medicine. I look forward to answering your questions.

[The statement follows:]

PREPARED STATEMENT OF LIEUTENANT GENERAL R. SCOTT DINGLE

Chairman Tester, Ranking Member Shelby, and distinguished members of the subcommittee thank you for the opportunity to speak to you on behalf of our Army's health professionals—Soldiers, Civilians, and their Families, about the state of Army Medicine. As the 45th Army Surgeon General, I want to express my gratitude for your unwavering support.

Today, in the 20th year since 9/11, over 190,000 Soldiers are engaged worldwide to support contingency operations, multiple exercises, and theater security cooperation activities. Before this novel coronavirus pandemic, Army Soldiers and Civilians had served throughout the world as part of the Joint Force. This last year, however, has made our work like no other in our Nation's history.

Before I begin my comments, I would like to acknowledge those tragically taken by the virus and other violent acts. They were mothers, fathers, first responders, healthcare providers, the elder, and the young, too many lives sacrificed. May they rest in peace.

I would also like to honor the Soldiers, civilians, contractors, and volunteers I am privileged to lead. As our 40th Chief of Staff of the Army states, "People First, Winning Matters!" I am proud to say that our People are ready to win. Within days of the Nation's call, Soldiers began building hospitals and testing centers where the Nation needed them most. Soldiers and the Federal Emergency Management Agency, state, and local partners converted the Javits Convention Center in New York City into an alternate care facility to meet the potential demand for hospital beds created by COVID-19. Our researchers, project managers, logisticians, public health officials, health facility and operational planners, and scientists were embedded with the interagency for the whole-of-government effort against COVID-19. Over 1,850 service members augmented civilian hospitals or community vaccination programs. You called. We were ready. We responded.

We marshaled our best and very talented professionals from across the Army. Our scientists and public health officials developed therapeutics, pandemic surveillance modeling, and testing strategies that produced the relevant outcomes we see today. Medical research and public health, the Army's vital asset in fighting diseases, contributed to the national effort under the Military Infectious Diseases Research Program and partnered with civilian, academic, and federal agency counterparts at all echelons in the whole of government response. Army Medicine did this while sustaining the health of our Soldiers, family members, retirees, and civilians both at home and abroad.

Since 2019, the Army and Army Medicine have been diligent in separating the resource requirements for the Services' readiness needs from benefit delivery. This deliberate effort has enabled the Army to expeditiously provide the foregoing actions to support operational and readiness requirements.

As The Army Surgeon General, my top priority is the health, welfare, and readiness of our Soldiers, their Families, our Civilians, and our Soldiers-for-Life, especially after two decades of persistent conflict across the globe. The Army and Army Medicine must consider the policy and funding needs to keep us ready and relevant for future challenges. This is what we must discuss today.

ARMY MEDICINE 2028

The Army Medicine 2028 vision operationalizes my plan to meet Army Medicine's strategic readiness priorities along with five key objectives—Ready, Reformed, Reorganized, Responsive, and Relevant.

—*Ready*.—Taking care of people, our Soldiers, and our Families, is paramount to readiness. Their physical, cognitive, and emotional health are the cornerstones to personal readiness. We will build and sustain strategic readiness to ensure

the operational force can win across all domains—land, air, sea, space, and cyber, by embracing modernization efforts through emerging technologies, synthetic training, and partnerships.

—*Reformed and Reorganized.*—Our Army remains committed to medical reform initiatives. Similarly, Army Medicine must effectively reorganize in accordance with reform requirements and Army Senior Leader directives to remain nested with the Army Campaign Plan and the Army Modernization Strategy.

—*Responsive.*—Army Medicine will tailor our expeditionary force to support the new paradigm of multi-domain operations, synchronized as part of the Joint Health Service Enterprise.

—*Relevant.*—Army Medicine must change at the speed of relevance. This includes the modernization of critical capabilities, technical innovations, and expanded alliances and partnerships to meet the shared challenges of our time.

ARMY MEDICINE STRATEGY

The strategic vision positions Army Medicine to achieve the objectives and priorities set forth by the Army. The vision of Army Medicine 2028 is clear: we are responsive and relevant with expeditionary, tailored, medically ready, and ready medical forces to support the Army mission to deploy, fight, and win in a joint, multi-domain, high-intensity conflict.

Nested with Army vision and priorities, I lay the foundation for evolving concepts, tactics, and requirements in five specific ways to achieve this vision. We must synchronize and integrate the medical effort. We must continue to build Army medicine readiness through proper manning, organizing, training, equipping, and leadership. We do this while continuing our modernization and medical reform efforts. We must do this while cultivating our international alliances and partnerships, force multipliers, and strategic assets to our national defense.

Synchronize and Integrate the Medical Effort.

In line with the Secretary of Defense's and Army senior leaders' guidance, Army Medicine will remain responsible and reliable for our teammates and stakeholders. We do this through our teamwork as the Army's medical voice regarding COVID-19 response, conserving the force's health and fitness, and caring for our beneficiaries, active and retired, at our treatment facilities. Our integrated efforts occur within and across the Army, between the Army and Defense Health Agency, and through the Joint Staff and Combatant Commands.

COVID-19 Response: The Nation called; the Army was there with the relevant expertise, equipment, and technology to respond to this unprecedented public health crisis. We will not rest until the virus no longer threatens our Nation. The greatest proximate challenge to our Nation's security is the threat of COVID-19. Army Medicine is decisively engaged in fighting COVID-19 at all levels, supporting the Department of Defense and interagency partners to eradicate COVID-19. I will participate in the statutorily mandated COVID-19 medical health system review panel in the coming months. Per fiscal year (FY) 2021 National Defense Authorization Act (NDAA) Section 732, my team will contribute and support the Secretary of Defense's strategy for pandemic preparedness and response plan. They are studying our response to COVID-19 and modifications to a pilot program on civilian and military partnerships to enhance medical interoperability and surge capability and capacity of the National Disaster Medical System. I finally want to express my gratitude to our Soldiers-for-Life. Last year, the Army asked our retirees to assist the historic effort to defeat COVID-19, and they responded. All of these men and women volunteers are true patriots and exemplars of the unwavering dedication of the Army Medicine team.

Research, Development, and Acquisition: Army Medicine is the Army's medical shield defending the force against COVID-19 in this whole-of-government approach. We responded to the Severe Acute Respiratory Syndrome, Ebola, and Zika outbreaks in the recent past. The Army Medical research enterprise delivered therapeutics, including antibodies in convalescent plasma, collaborated on the study of 40 million compounds, and managed approximately 80% of the Defense Department's investments dedicated to medical research and product development. To date in FY21, the Medical Research and Development Command dispersed \$363 million for research, development, test, and evaluation; \$280 million for operation and maintenance; and \$59 million for procurement across myriad programs supporting the health of the Department and our Nation. In the year since COVID-19 became a household word, our research and development team used these needed funds to protect the Nation from deadly viruses.

Health and Holistic Fitness (H2F): Holistic Health and Fitness, or H2F, is now part of our doctrine per Army Field Manual 7-22. As the Army Chief of Staff states,

“People are my #1 priority: Our Army’s people are our greatest strength and our most important weapon system.” To maintain our military strength, we will invest in understanding, assessing, and improving the American Soldier’s holistic health. That means we have a comprehensive schema to enhance and maintain the Soldier’s performance by making Army medical and health professionals part of building cohesive combat teams. In April 2020, 3.75% of the Army is currently medically non-deployable, equating to 38,400 Soldiers. Musculoskeletal injury contributed significantly to the Army’s healthcare burden, negatively impacting Soldier health and Army readiness. To conserve the force, Army has 536 military authorizations in the future years’ defense program (FYDP) between 2022 and 2026 for physical therapists, occupational therapists, registered dietitians, and enlisted specialists to be forward arrayed within our combat formations to prevent or mitigate injuries and ensure faster recovery to maintain combat power.

Army Recovery Care Program (ARCP): The Army maintains a robust Warrior Care program for managing recovery and complex care for wounded, ill, and injured Soldiers across all Army components. Our program, formerly the Warrior Care and Transition Program, is a critical enabler of Army readiness. Through the use of 14 Soldier Recovery Units, ARCP manages the recovery of wounded, ill, and injured Soldiers requiring complex care at Division/Corps installations and specialty medical centers. The program also provides resources and advocacy for Families and caregivers of Soldiers recovering in the program. Since the program’s inception in 2007, more than 84,000 Soldiers have entered the program. As of October 1, 2020, the program completed a two-year Army-directed restructure. Its current population of 1,752 reflects the single entry criteria for all three components and is in line with original restructure estimates of 1600–1800 as of December 31, 2020. The latest restructure has reduced 501 authorizations and \$35 million for Program Objective Memorandum (POM) 2021, but will not decrement operations and support to the wounded warrior.

Medical Military Construction: The construction of medical healthcare and research facilities supporting Army and Department of Defense personnel and missions continues. Army Medicine, the United States Army Corps of Engineers, and the Defense

Health Agency provide collaborative leadership and management to multiple projects. I thank you for your enduring support of the medical military construction program. The Army will recapitalize over 78% (15 of 19) of inpatient facilities between 2005 and 2026. The military health system continues to require future investments in military construction to support safe, quality care for our Soldiers, Family Members, and Soldiers for Life, as well as capital investments for medical research and public health activities. As of this submission, there are currently 14 active hospital, medical research, clinic, lab, and blood program projects supporting Army equities.

Departments of Defense (DOD) and Veterans’ Affair (VA) Partnership: Caring for our Soldiers-for-Life reflects our commitment to People and synchronizing the medical effort. In collaboration with the VA, the Army has an integrated joint effort for providing care to our retired population through robust healthcare resource sharing programs. Between 2018 and 2019, Army Medicine provided \$138.2 million in reimbursable care to veteran beneficiaries in our Army treatment facilities. All Army facilities with excess capacity to provide care to the veteran population under the healthcare resource sharing program. Our Soldiers-for-Life are America’s strategic reserve. We are obligated to care for them.

Build Readiness.

Building and maintaining readiness is critical to my strategic goal. Army Medicine is pivoting to proficiently trained and manned units led by competent leaders, equipped with modern capabilities to provide expeditionary life/limb-saving to a multi-domain operations capable force by 2028. I acknowledge legislation regarding our force mix options and service models, as well as legislation regarding the military medical manning end strength. Readiness and deployability must remain a top priority of Commanders and Soldiers.

Medical Readiness: To build combat readiness, we affirm the need to reduce the Army’s non-deployable rate to 5%, even during the pandemic. This means that despite COVID–19, Soldiers continued to complete their annual health assessments and dental exams. Initially, COVID–19 impacted our ability to conduct the screenings. To clear the backlog of Soldiers who fell out of compliance during the early phase of the pandemic, we began to use video or telephonic health assessments. At the end of calendar year 2020, only 3.75% of Soldiers were medically non-deployable.

Individual and Collective Training: The Army is committed to the readiness for large-scale combat operations. I will provide the combat force high-quality medical care across the full continuum of combat casualty operations by reforming our medical training processes and seeking innovative partnerships and solutions to providing a ready medical force. Army Medicine is using various initiatives to build deployment readiness:

- Army Graduate Medical Education.*—Five to seven years of training after medical school is required to produce a board-eligible surgeon. The graduate program generates 96% of critical wartime specialty surgeons.
- Military-Civilian Partnerships.*—Army Medicine has entered into medical training agreements with civilian trauma centers and medical centers around the country. Pursuant to recent legislation, Army Medicine has placed doctors, nurses, and medics into facilities across the Nation, where, for example, members from forward surgical teams maximize their exposure to a high volume of patients with critical injuries. This cost-efficient initiative provides skills sustainment opportunities alongside our civilian counterparts in premier trauma centers and hospitals.

Support Modernization of the Medical Force.

Army Medicine's modernization efforts include developing medical concepts parallel with Army efforts. These expeditionary medical capabilities leverage emerging technologies, design the future medical force, ensure interoperability, and invest in synthetic training environments to provide the "sets and reps" required to be battle-field-ready. We must consider leveraging technology and updating our strategies to meet the realities of the landscape.

Recruiting and Retention of Health Professional Officers (HPOs) (Talent Management): Our Army's philosophy is People First, and our attitude is Winning Matters. The Army is about People. I want to thank our legislators for acknowledging the need to increase special pay incentive programs and rate caps. The increase in health professional compensation assisted with medical accession bonuses, health professional scholarships, Financial Assistance Program, loan repayment, professional training and education programs and incentives, allows us to recruit and retain health professional officers as they make the tough decision to serve the Nation or answer the lucrative opportunities in the private sector. Per section 757 of the Fiscal Year 2021 NDAA, at the direction of the Department of Defense, we will participate in the congressionally-mandated review of our force mix options and the service models to enhance our medical force's readiness.

Virtual Health: As we sustain and modernize Army Medicine's talent management systems and organization, our hardware and software must match the dynamic threat landscape of the 21st century. In this regard, the legislation directs a review of our use of virtual health services across the Army. Leveraging this capability during the pandemic was critical in delivering medical treatment and timely access to care. During the year of COVID-19, when many dreaded entering medical treatment facilities, telehealth provided direct care to our patients. In FY15, there were over 40,000 virtual health encounters in Army Medicine. About 80% of these encounters were related to behavioral health. From March 2020 to January 2021, we had an extraordinary 4.2 million virtual health encounters. Virtual health improves patient satisfaction, continuity of care, readiness, and access-all components for efficient and effective medical care.

Medical Simulation/Synthetic Training: The Department of Simulation at the Medical Center of Excellence is the lead agency for Army medical modeling and simulation policy and strategy. Working with the Army's Program Executive Office Simulation, Training and Instrumentation, and in collaboration with Army Futures Command, our simulation efforts will improve medical skill training through synthetic cross-functional training. The artificial environment will provide the realistic repetitions necessary to train and sustain combat lifesavers and medical personnel for Multi-Domain Operations. Other examples of our technological needs include:

- Integrated Visual Augmentation System (IVAS).*—This system enhanced casualty care through a combination of technologies and augmented reality delivered in the form of a Head-Up Display device. The system will include a casualty response function enabling the Close Combat Force to exercise squad-level response to taking casualties in tactical training scenarios.
- Tactical Combat Casualty Care (TC3) Simulation.*—A first-person game that allows a Soldier to play a combat medic's role during an infantry squad mission in an urban environment.
- Vertical Lift.*—The next-generation medical vertical lift, such as the medical variant of the Future Long-Range Assault Aircraft, will give Army Medicine an

aircraft with increased speed, range, survivability, and maneuverability to allow the Army to evacuate the injured from the battlefield to the point of care.

We must make investments to develop further and purchase the required hardware and software to create the Synthetic Training Environment Medical training platforms and next generation of vertical lift.

Medical Reform.

The Medical Reform initiative aims to ensure the highest Soldier and provider medical readiness while reducing administrative requirements associated with military treatment facilities (MTFs) health and business processes, procedures, and practices to deliver more effective and efficient beneficiary care at less cost. The Department of the Army and Army Medicine are committed to this initiative as we diligently evaluate the Medical Department's structure, ensuring its coherence to the needs of Title 10 and our operational demands.

Medical and Dental Treatment Facility Transition: Due to the novel coronavirus response, the military health systems reform efforts were paused in the last year. The Defense Health Agency will assume authority, direction, and control for all United States-based MTFs by September 30, 2021. The Army will transfer 126 Medical and 60 Dental Treatment Facilities to the Defense Health Agency. The Army retained statutory Title 10 responsibility for training, readiness, and oversight of Soldiers at the Medical Treatment Facilities, Dental Treatment Facilities, Public Health establishments, and Veterinary Treatment Facilities.

Defense Health Program Funds Transfer: The FY21 appropriations drafted by this committee provided more than \$1.1 billion from the Defense Health Program to the Army Operation and Maintenance account consisting of over 15 service-centric medical readiness programs—over \$655 million within Army Medicine and over \$445 million across Army Major Commands. We understand that we need to further evaluate our readiness requirements in subsequent years as the medical health systems reform and transition progress. We acknowledge this committee's recommendations on the need for precise details and justification for Army's Medical readiness programs. Finally, we are also working with the Defense Health Agency to ensure that those medical readiness services within the Defense Health Agency purview (about \$895 million) are meeting the Army's requirement for comprehensive readiness for our Soldiers and their family members.

Strengthen Alliances and Partnerships.

Finally, our allies and partners are collaborators and force multipliers with whom we engage through various multilateral and bilateral affiliations, security cooperation programs, and global health engagement opportunities. From the early 1800s, to today, and into the future, the Army has a long-standing history responding to international public global health issues as a result of our responsibility to protect the health of our forces and to ensure that they are ready to deploy for missions anywhere in the world at a moment's notice. One component of global health engagements involves building, sustaining, and improving partner capacity so that nations can mature into competent combat health service support providers for their forces and coalitions in which they will operate. Among other capabilities, my goal in the Army Medicine strategy is to create a global network of military medical capabilities that will provide niche and system medical services to ensure ready, relevant, responsive, and excellent health service support both in the field and in the institutional setting.

Funding for global health activities, partnership activities, and global health engagements has always been a challenge. As we have seen in the last year, our scientists' international work is a crucial funding concern. Allocated appropriations from Defense Health Program funds provided by our partner nations do not yield impactful results. Partner nation, Combatant Command, and Army Service Component Command prioritization toward combat and combat support capabilities are frequently below the cut line, underfunding global health engagements and medical security cooperation.

To achieve global health objectives, medical forces would benefit from funding investment to continue and capitalize on our critical relationships with international ministries of defense, health, interior, academia, non-governmental, and private sector organizations. As required by statute, we will work with the Department to assess the feasibility of establishing medical security partnership with Taiwan (FY21 NDAA, Section 1260B) and the grant program to collaborate with Israel on post-traumatic stress disorder research.

Medical Research and Development Command laboratories in Thailand, Philippines, Nepal, Cambodia, Kenya, Nigeria, Tanzania, Uganda, and the Republic of Georgia conduct essential surveillance of biological threats and groundbreaking re-

search on infectious diseases and diseases of military and public health significance. Through regional and functional health commands, the Army's global presence also serves as a force for good, offering humanitarian assistance and disaster relief when requested.

The Army Medical Center of Excellence provides officer and enlisted medical leadership training to approximately 200 soldiers from partner nations. Of these, our relationship with the Israel Defense Force medical services, based on the 1978 United States-Israel Data Exchange Agreement on Military Medicine, or "Shoresh," sustained our relationship through their International Medical Programs office and the Army's Medical Strategic Leadership Program. Similarly, our relationship with Taiwan (one which Army Medicine looks forward to expanding) was sustained through our educational programs, which had 25 participants in recent years.

Army Medicine will build on our experience from multinational staff hospitals in Iraq and Afghanistan as the opportunity affords. We do this while leveraging current experiences in Europe with our allies and partner nations to strengthen our many long-lasting international relationships with the North Atlantic Treaty Organization and the American-British-Canadian-Australian-and New Zealand alliances. When matured, these relationships will enhance the readiness of future US military operations in that region. The corporate and national response to the global pandemic, ongoing research and development of freeze-dried plasma, advancements in prosthetics and rehabilitation, and more effective treatments for post-traumatic stress disorder and other combat stress-related injuries have made Army Medicine a proven and formidable partner in global health and military medicine.

CONCLUSION

In closing, I want to thank the committee for your long-standing support to the Army and Military Medicine. I remain committed to working with our defense, interagency, intergovernmental, multinational, and civilian partners to improve Army readiness. At the same time, our healthcare professionals continue to care for our Soldiers, Civilians, and their Families.

From the foxhole to the fixed facility—Army Medicine will be ready, reformed, reorganized, responsive, and relevant. My vision will ensure that we sustain mutual trusted relationships within the Army, the Joint Force, and the Nation. When a Soldier calls for a medic, Army Medicine will be ready and responsive with expertly trained Soldiers capable of healing injuries to the body. Medical units should be adequately manned and equipped with the best equipment and technology. It is not about fighting the last war. We must have the People, cutting-edge tools, medical concepts, doctrine, capabilities, and the training for the next conflict. I appreciate the subcommittee's work and your continued support to our Soldiers, Army Medicine, and our Army.

Senator TESTER. Thank you, General Dingle.
General Hogg.

STATEMENT OF LIEUTENANT GENERAL DOROTHY A. HOGG, SURGEON GENERAL, DEPARTMENT OF THE AIR FORCE

General HOGG. Chairman Tester, Vice Chairman Shelby, and distinguished members of the subcommittee, thank you for the opportunity to testify on behalf of more than 55,900 total force airmen who comprise the Air Force Medical Service. Your sustained confidence and support enables us to remain mission-focused, excellence-driven, and ready to fight tonight.

Over the past year, our airmen have been involved in every aspect of the COVID-19 response. From the early days of initial public health emergency response to supporting the whole-of-government vaccine administration efforts, Air Force medics showed their ability to innovate.

When COVID-19 epicenters in New York, California, Texas, and North Dakota were facing critical staffing shortages, we acted quickly, embedding critical care strike teams directly into civilian facilities.

Today we have 1,000 Air Force medics deployed to 11 FEMA vaccination sites in 10 States to administer COVID-19 vaccines, and we expect them to surpass the 1 million mark this week.

A year before the first COVID-19 case hit the U.S., we established our newest C-STARS training program at the University of Nebraska in Omaha. This Center for the Sustainment of Trauma and Readiness Skills focuses on disease containment.

Our infectious disease specialists worked alongside civilian counterparts to treat some of the very first COVID-19 patients using the university's biocontainment unit.

We took our air medical evacuation capabilities into new territory when we were tasked to transport COVID-19 patients. Early in the pandemic, the rapid rise of cases drove the need to move more patients at once while mitigating the spread of COVID-19 to our aircrew members.

We partnered with teams across the Department of Defense and the civilian industry to develop a new infectious disease transport system called the Negatively Pressurized Conex. This Conex can safely transport up to three times as many patients as the previous isolation system, and as of 19 April, we have completed 96 missions and moved 366 COVID-19 patients safely.

While battling the pandemic, we also remained dedicated to the MHS (Military Health System) transformation efforts. We have worked side by side with the Defense Health Agency to identify all necessary processes needed to mature their functional capabilities. We also implemented a new medical reform model to improve our airmen's and guardians' readiness and deployability.

We reorganized our medical treatment facilities into two squadrons. The first squadron focuses on the health of our airmen and our guardians, and the second squadron focuses on the health of our beneficiaries. This new model has been implemented at 66 bases, and early analysis has already shown the model enhances force readiness and lethality.

This pandemic brought unprecedented challenges, but it also provided opportunities to accelerate, change, or lose, to become more agile, resilient, and capable to face the unknown. This is what we train for. We remain ready for the right. This mentality must remain in focus as we evolve to face the next major threat.

It has been an honor to serve as the Air and Space Force Surgeon General alongside extraordinary medical professionals on the joint team. This is my final time to appear before this subcommittee, as I will be retiring this summer.

Thank you for your continued support and for the opportunity to address you today, and I look forward to answering your questions. [The statement follows:]

PREPARED STATEMENT OF LIEUTENANT GENERAL DOROTHY A. HOGG

Chairman Tester, Ranking Member Shelby, and distinguished members of the Subcommittee, thank you for the opportunity to testify on behalf of the 55,945 active duty, reserve, national guard, and civilian Airmen who comprise the Air Force Medical Service. It is an honor to serve with these Airmen who demonstrate their ongoing dedication to the mission resulting in the success of the Department of the Air Force. Your sustained confidence and support in our efforts enables us to remain mission-focused, excellence-driven and ready to fight tonight.

The Air Force Medical Service supports the Department of the Air Force's mission to fly, fight and win, and defend American interests in air, space, and cyberspace.

Our strength resides in our resilience and on our willingness to succeed in austere, dynamic, and challenging environments. Our readiness focuses on delivering life-saving care, whether on the battlefield or within our own communities. We train to successfully operate in field hospitals with limited supplies, pushing the limits of our capabilities to stretch our problem solving abilities. The Air Force Medical Service can successfully function, in fact, excel, on any cargo aircraft available to move our service members to higher levels of care. Air Force medics ensure combatant commanders have a medically ready and fit force. With the launch of our newest military branch, the U.S. Space Force, Air Force medics are also responsible for maintaining the readiness for Guardians operating the nation's space capabilities. We embrace these unique physical and psychological demands of Space mission sets and are planning for the future demands of space medicine requirements.

My responsibility to provide the best prepared medical force has not been dampened by the challenges of the ongoing pandemic, in fact, it has proved the resilience and flexibility of our Airmen. This pandemic tested our capabilities; we faced many challenges, but at the core of our success was our medics. Their training, commitment, and dedication to service provided a resource our nation depends upon.

AIR FORCE MEDICAL SERVICE COVID-19 RESPONSE

Over this past year, our medics have been put on the front lines like never before, to combat a new enemy, one that struck in our own backyards and bases around the globe. The pandemic brought military medical capacity and capability to the tip of the spear in our nation's response in combating COVID. Our medical Airmen from nearly every specialty and position have been working tirelessly alongside our sister services and civilian partners to conquer this disease. We have deployed to the hardest hit areas of our country to support overrun civilian hospitals. In the midst of these challenges, our Airmen have continued to innovate and respond to my call for disruptive innovation. One example is the Negatively Pressurized Containment unit. During the 2014 Ebola epidemic, it became clear the Department of Defense needed a way to safely transport multiple patients within the same airframe who were suffering from a highly infectious disease. Four months from when the need was identified, the transport isolation system was introduced and ready for patient movement. It is easily transported on existing cargo aircraft, including the C-130 and the C-17 and provides a contained area for medics to care for these patients. While we trained to execute this system, it never saw an operational mission until the COVID-19 pandemic. The first operational mission for this isolation system took place on April 10, 2020, when three COVID-19 positive patients were transported from Afghanistan to Ramstein Air Base, Germany.

While the mission was a success, the rapid rise of COVID-19 case numbers required us to move larger numbers of patients at one time. This was a challenge, but our Airmen partnered with teams across the Air Force, Department of Defense, and civilian industry, under the direction of the Program Executive Office for Agile Combat Support, to develop and procure an innovative solution. In less than 100 days, a new isolation system, the Negatively Pressurized Conex, was launched. This innovation rapidly went from an idea to a solution, and on July 1, 2020, Airmen successfully transported 12 COVID-19 patients on a C-17. As of February 25, 2021, we have completed 39 missions and moved 216 COVID-19 patients in this system.

Our Air Force medics also provided the nation with innovative solutions to solve bed space and personnel shortages. When COVID-19 epicenters in New York, California, North Dakota, and Texas were experiencing bed space shortages, our team went to work developing solutions and designed four COVID Theater Hospitals, consisting of more than 200 beds, to provide the support the communities were desperately seeking. As cases surged, it soon became apparent that these solutions would not accomplish the immediate needs of our civilian partners, so we quickly tailored a better solution. We broke our theater hospitals into smaller critical care strike teams and embedded them directly into civilian facilities to augment their capabilities. Nearly 800 Air Force medics were deployed into civilian facilities to work alongside their civilian counterparts. Most recently, we deployed an additional 1,000 Air Force medics to 11 vaccination sites in 10 states to administer COVID-19 vaccines. As of April 6, 2021, we have successfully administered more than 678,162 vaccines.

DELIVERING CARE TO OUR WARFIGHTERS

While the nation's attention shifted to combating COVID-19, the Air Force Medical Service never took the eye off of the ball in supporting the operational demands of the Air and Space Force missions. Our medics hold the sacred responsibility for

treating service members so they can complete the mission and return home safely. We have continued to bolster our existing capabilities.

Currently, we are halfway through a five-year rollout of a new initiative to embed base Operational Support Teams at all Department of the Air Force installations. The Operational Support Teams consist of a clinical psychologist, social worker, physical therapist, exercise physiologist, and a team leader who are all focused on improving operational performance of our Airmen. The team will provide direct unit-level medical engagement outside of Air Force military treatment facilities. This is accomplished by enhancing both physical and psychological resiliency, as well as employing military occupational injury prevention techniques. These teams will temporarily embed into high-risk squadrons and begin to build and foster trusting relationships, conduct unit-focused needs assessments, provide interventions, and conduct consultations. The overall goal of this initiative is to address unit-specific health concerns before they have a chance to negatively impact Airmen, Guardians, or the mission.

KEEPING MEDICAL AIRMEN READY TO DELIVER CARE

The readiness of my medics is my number one priority. The primary readiness platform for medical skills are our military treatment facilities. However, some of our treatment facilities do not have the patient volume, diversity, and acuity Air Force medics require to have a current skill set. To address this gap, I have developed several partnerships and training agreements with civilian organizations. In the past year, we continued to grow these opportunities with our most recent partnership—the University of Nebraska Medical Center. In 2019, we started our newest C-STARS-Omaha program with a primary focus on disease containment. This site focuses on the care of highly infectious disease patients. Our Air Force medics, working alongside their civilian counterparts, were able to treat some of the first COVID-19 patients utilizing the university's biocontainment unit. On March 1st of this year, we launched the inaugural course on principles of biocontainment care, covering topics on recognition, diagnosis and management of highly-infectious disease, infection prevention and control principles, and safe donning and doffing personal protective equipment. This course will pay huge dividends for future pandemic events.

In addition to establishing civilian partnerships to maintain currency, we are also developing an internal training program called Medic-X. This program is designed to expand medical support skills in mass casualty scenarios where patient load overwhelms medical capabilities. This approach fundamentally changes what defines an "Air Force Medic," extending response capabilities to all Air Force Medical Service skillsets and ranks, including non-clinical careers such as, pharmacists, lab officers, medical administrators, and medical logisticians. We have identified 58 specific skills aimed at equipping non-clinical Airmen with the ability to respond in the event of a mass-casualty event. A beta test of non-clinical personnel was conducted in May 2020 at 10 different locations with a 96.5% success rate of comprehension, retention and execution of these skills. We plan on rolling out the Medic-X program in phases with the goal of full integration into all of our bases by 2025.

COMMITMENT TO MILITARY HEALTH SYSTEM TRANSITION AND TRANSFORMATION

Despite challenges posed by implementing the changes outlined in section 702 of the 2017 National Defense Authorization Act and COVID-19, we remain dedicated to the smooth transition of the delivery of the health benefit, and associated functions and personnel to the Defense Health Agency, so I can focus on my responsibility of delivering medically-ready Airmen and Guardians and ready medical Airmen. The Air Force Medical Service has been engaged with the Defense Health Agency to help them formalize processes, mitigate risks, and address challenges. We have provided a detailed framework that identified all functions and personnel required to stand up DHA's functional capabilities. We also worked with DHA to identify ways to standardize these services across all military treatment facilities. Despite a temporary pause in transition activities due to COVID-19, the Air Force Medical Service continues to provide the necessary transition support, providing requested resources and manpower needed to maintain specific functional capabilities at military treatment facilities. This direct support is expected to end on October 1, 2021.

As our Air Force Military Treatment Facilities continue to transition to the authority, direction, and control of the Defense Health Agency, we also implemented an Air Force Medical Reform Model to align with the Air Force's Strategic Plan to enhance readiness, increase lethality, and utilize cost-effective modernization. Resource-neutral changes in structure were applied to focus and improve the

deployability of the forces. Under this new model, we reconfigured and launched two new squadrons with distinct missions. The first squadron, the Operational Medical Readiness Squadron, focuses on the health of Airmen and Guardians, and the second squadron, the Healthcare Operations Squadron, focuses on delivering care to all other beneficiaries. Analysis to date, has shown a decrease in the duration of Mobility Restriction by 6.6 days, an increase in Individual Medical Readiness by 1.1% and a decrease in Non-Deployable, All Reasons status by 2.3%.

NEW FRONTIERS AND NEW DOMAINS

Our readiness posture has equipped us to swiftly and effectively respond to COVID-19 while maintaining the demands of our mission. We now need to be ready for a more dynamic and demanding battlefield, forcing us to push the boundaries of our capabilities even further. Our future ground medical forces and equipment must be more agile, lighter, leaner, and more autonomous when considering logistical support may be limited. Wherever our Airmen and Guardians go, Air Force medics must follow.

As mentioned earlier, the U.S. Space Force is now a year old. Space Force medical support focuses on addressing the occupational challenges that emerge while operating unmanned satellites. As the demands of the Space Force increase, so will the necessary medical support to keep those members fit for duty.

The Arctic region's increasingly strategic importance, along with the Department of Defense's significant regional investment, requires a deliberate and forward-thinking approach to ensuring the U.S. can compete and protect the nation's interests in the region. This means leading the development and establishment of the Air Force Medical Service's capability to provide medical care in this environment. In support of the Department of the Air Force Strategy, on my direction, the Air Combat Command Surgeon, in collaboration with the Air Force Medical Readiness Agency conducted a Capabilities-Based Assessment focused on identifying capability gaps and requirements necessary to operate and sustain medical operations in extreme cold environments, called Below Zero Medicine. We convened two Below Zero Medicine Summits, made up of diverse groups of subject matter experts, to support the establishment of a Medical Pilot Unit and a Cold Weather Region Center of Excellence (Medical) at Joint Base Elmendorf-Richardson. This initiative is focused on identifying and implementing innovative ways to bring the hospital to the patient in any environment.

The ongoing COVID-19 pandemic has consumed much of the nation's attention, bringing with it unprecedented and unpredictable challenges. It forced our medics to adapt at breakneck speeds and face an unknown enemy, and they did just that. They worked to keep themselves safe, to protect the mission and continue to save lives. While many may see a group of military medics working against insurmountable odds, I see military medics putting their training into action. I see the deployment of agile, resilient and capable medics equipped with what they need to face the unknown. This is what we train for—we remain ready so we can fight tonight. This mentality must remain in focus as we evolve to face the next major threat.

I am honored to serve as the Surgeon General for both the Air Force and Space Force and to work alongside the talented leadership in both Services, our Army and Navy partners, and the DHA as we continue to battle COVID-19 and transform the Military Health System. Most importantly, I am honored to work for our medics who are at the frontlines whenever and wherever they are needed. Thank you to the Subcommittee for your continued support of our remarkable Air Force medics and the health of our Airmen, Guardians, Soldiers, Sailors and Marines.

Senator TESTER. Thank you, General Hogg, and we appreciate your support to the services and wish you well in retirement when that time comes.

Admiral Gillingham.

STATEMENT OF REAR ADMIRAL BRUCE L. GILLINGHAM, SURGEON GENERAL, DEPARTMENT OF THE NAVY

Admiral GILLINGHAM. Chairman Tester, Vice Chairman Shelby, distinguished members of the subcommittee, it is my privilege to update you on Navy Medicine. I am grateful for your continued leadership and support as we execute our medical readiness mission in support of the United States Navy, United States Marine Corps, world's premier Naval Force.

Last year has been like no other in our lifetimes as we confronted a deadly adversary, the SARS-CoV-2 virus and the disease it causes, COVID-19. The battle continues today.

Navy Medicine's operational tempo remains high as we protect the readiness and health of our sailors, marines, and their families, along with making direct contributions to the whole-of-Nation pandemic response.

To date, we have deployed over 6,000 active and reserve component medical personnel in support of operational COVID-19 missions. I want to assure you that despite these unprecedented challenges, the One Navy Medicine team remains relevant, ready, and responsive.

We continue to be guided by our strategic priorities: people, platforms, performance, and power. Well-trained people working as cohesive teams on optimized platforms, demonstrating high-value, high-velocity performance that will project medical power in support of naval superiority.

With the earliest identification of the SARS-CoV-2 virus, it was evident that we were battling an adversary whose behavior is highly unpredictable, particularly with respect to its asymptomatic transmission. While all of us in military medicine are trained to respond to medical emergencies, we quickly recognized that protecting our personnel in this public health crisis along with maintaining operational effectiveness would be our primary mission.

Actions and intervention by experts across Navy Medicine during early stages directly impacted our ability to better understand the virus, mitigate and contain its spread, effectively support ongoing fleet operations, and preserve Navy and Marine Corps readiness out forward.

We rapidly applied lessons learned from the early outbreaks on board *USS Theodore Roosevelt* and *USS Kidd* and continually incorporated the latest critical information from the Centers for Disease Control and Prevention as well as Navy Medicine, public health, and R&D experts.

Navy leadership quickly operationalized this guidance for the fleet in the form of standard operational guidance, and this is currently in its fourth update. This direction incorporates the most up-to-date scientific and public health information, to include testing, restriction of movement, isolation, quarantine, physical distancing, face coverings, contact tracing, and now vaccinations. Importantly, our sailors and marines have demonstrated tremendous personal responsibility, resilience, and adaptability in responding to the pandemic.

Their work in concert with strong commitment from our operational leaders has been instrumental in allowing our ships and personnel to stay mission capable, despite the pandemic.

Our highest priority remains ensuring that all Department of Navy personnel have access to the vaccine in order to protect themselves, their shipmates, their families, and their community. As the Navy Surgeon General, I have been clear in my guidance that these vaccines are for the most effective protection against this deadly virus.

The bottom line is that we are getting shots in arms and providing our personnel with what I refer to as "biological body

armor.” To date, Navy sites have administered over three-quarters of a million vaccines, and over 50 percent of our sailors and marines have now received at least one vaccine dose.

Navy Medicine continues to answer the call to help our Nation. Navy and Marine Corps personnel are now currently deployed around the country to assist with vaccine administration in community vaccination centers.

I recently had an opportunity to see firsthand the significant impact they are making in the lives of our fellow citizens affected by the virus.

Navy Medicine’s COVID-19 response is marked by grit, resolve, and an unbreakable spirit. While battling the pandemic remains a primary line of effort, we remain fully engaged in all aspects of our mission of improving readiness and enhancing operational capabilities to increase warfighters’ survivability.

My written testimony provides you details on many of these important initiatives that directly support physical and mental well-being of our sailors, marines, and their families.

In summary, the Nation depends upon our unique expeditionary medical expertise to support our Naval Forces. The Navy Medicine team, some 63,000-strong, is privileged to be entrusted with these responsibilities.

Again, thank you for your leadership, and I look forward to your questions.

[The statement follows:]

PREPARED STATEMENT OF REAR ADMIRAL BRUCE L. GILLINGHAM

Chairman Tester, Vice Chairman Shelby, distinguished Members of the Subcommittee, it is my privilege to update you on Navy Medicine. The last year has been like no other in our lifetimes as we confronted a deadly adversary, the SARS-CoV-2 virus and the disease it causes, COVID-19. The battle continues today. Throughout this global pandemic, the operational tempo of Navy Medicine remains high, as we protect the readiness and health of our Sailors, Marines and their families, along with making direct contributions to the whole of Nation response to help our fellow citizens in need. I want to assure you that despite these unprecedented challenges, the One Navy Medicine team remains relevant, ready and responsive. I am grateful for your continued leadership, support, and confidence as we execute our medical readiness mission in support of the United States Navy and United States Marine Corps, the world’s premier Naval Force.

ALIGNING STRATEGY, PRIORITIES AND RESOURCES

Foundational to Navy Medicine’s mission effectiveness is full synchronization with the strategic direction articulated by the Chief of Naval Operations and Commandant of the Marine Corps in their seminal documents CNO Navigation Plan 2021 and the Commandant’s Planning Guidance 2019, respectively. This guidance, along with the Tri-Service Maritime Strategy (2020), details the way forward in meeting current and future challenges posed by a dramatically changing international security environment. We in Navy Medicine recognize that our lines of effort must be vectored to support these strategic imperatives. Our four priorities—People, Platforms, Performance and Power—ensure important readiness linkages to our Marines and Sailors: Well-trained People, working as cohesive teams on optimized Platforms, demonstrating high value Performance that will project medical Power in support of Naval Superiority.

To help ensure that we execute these critical priorities, I have added additional analytical rigor and alignment to our strategic planning process through a series of directive-type memoranda for our key program investments. Each must align with one or more of the Navy Medicine priorities. This process is critical as we shape our decision making; including, guiding our resource allocations, assessing organizational capacity and capability, and assessing performance. Overall, I am encouraged that these priorities are taking hold at all levels within Navy Medicine. Our per-

sonnel recognize that Navy Medicine is a team sport; and as such, everyone, collectively and individually, is performing an impactful role in contributing to mission success.

In FY2021, additional Defense Health Program (DHP) resources were realigned to the Department of the Navy (DON) to support medical readiness activities which occur outside of military medical treatment facilities (MTFs). These resources are important to DON's efforts to execute non-MTF responsibilities in direct support of medical readiness. We are grateful for the financial resources provided in the FY2021 Defense Appropriations Act, as well as the supplemental funding that was provided last year in response to the COVID-19 pandemic. I want to assure you that inherent in our business practices is the application of sound fiscal stewardship of to the resources entrusted to us.

RESPONDING TO THE COVID-19 PANDEMIC

With the earliest identification of the SARS-CoV-2 virus, it was evident that we were battling an adversary whose behavior was highly unpredictable. While all of us in military medicine are trained to respond to medical emergencies and crises, we quickly recognized that protecting our personnel in this public health emergency, along with maintaining operational effectiveness, would be our primary mission. Actions and interventions by experts from the Navy Medicine Public Health and Research and Development enterprises during the early stages, directly impacted Navy Medicine's ability to better understand the virus's behavior, mitigate/contain the virus spread, effectively support ongoing Fleet operations, and preserve Navy and Marine Corps readiness. To illustrate, using state-of-the-art technologies and research-use only assays for COVID-19, personnel from the Navy Medical Research Center deployed to *USS THEODORE ROOSEVELT* (CVN-71) providing the first COVID-19 detection onboard a Navy ship, and filling a critical gap in COVID-19 in the Fleet prior to the Food and Drug Administration (FDA) issuing Emergency Use Authorization (EUA) for COVID-19 diagnostic devices available onboard ships.

This work continued as we learned how to deal with the virus from the early outbreaks on *THEODORE ROOSEVELT* and *USS KIDD* (DD-661), particularly regarding its asymptomatic transmission. Rapidly applying lessons learned from these ships and continually incorporating the latest critical information from the Centers for Disease Control and Prevention (CDC) and Navy Medicine experts, Navy leadership quickly operationalized this guidance for the Fleet in the Standardized Operational Guidance (SOG), currently in its fourth update. SOG incorporates the most current scientific and public health information to include testing, restriction of movement, isolation/quarantine, physical distancing, face coverings, contact tracing, and vaccinations. This direction is critical for both individual and unit health protection and is impactful in preserving operational readiness while protecting shipmates, installation and communities from COVID-19 transmission. Our Sailors have demonstrated tremendous personal responsibility, resilience and adaptability in responding to the pandemic. More than a year from the onset of the initial outbreak, the SOG, along with other key lines of efforts throughout the Navy, have been instrumental in allowing our ships and personnel to stay mission capable despite the pandemic.

In an effort to gain more insight into SARS-CoV-2 virus, Navy Medicine conducted two important studies, both of which were published in the New England Journal of Medicine on November 11, 2020: (1) An Outbreak of COVID-19 on an Aircraft Carrier analyzed epidemiological data from the outbreak of SARS-CoV-2 onboard *THEODORE ROOSEVELT* in order to understand the transmission and impact of SARS-CoV-2 on the crew. This work provides a better understanding of the behavior of the virus shipboard and supports the development of updated guidance for the Fleet to mitigate future outbreaks. (2) SARS-CoV-2 Transmission among Marine Recruits during Quarantine reports on the COVID-19 Health Action Response for Marines (CHARM) which took place at Marine Corps Recruit Depot Parris Island and examined asymptomatic and symptomatic transmission in a young adult population. A follow-on study with the initial Marine volunteers, CHARM 2.0, is currently underway. This research is important for Naval Forces but also reaffirms our commitment to widely contribute to further the understanding of the SARS-CoV-2 virus both nationally and internationally.

An important epicenter for actionable information is our Navy Medicine Scientific Panel, comprised of Navy Medicine scientists, clinicians and public health experts. They advise leadership and work directly with operational medical personnel to facilitate rapid consultation and enable high velocity learning with respect to COVID-19. In addition, their work is reflected in the widely disseminated Navy Medicine

Weekly COVID-19 Public Health Report that provides current and timely scientific, clinical and surveillance updates.

In addition to Navy Medicine's work efforts in support of Navy and Marine Corps unique requirements, collaboration with the DoD COVID-19 Task Force, the Joint Staff, the Defense Logistics Agency, the DHA, the other Services, Uniformed Services University of the Health Sciences (USUHS), interagency partners, and many others have been important to the pandemic response. This work provides the needed coordination, standardization, and unity of effort in critical areas impacting all the Services including diagnostics and testing, therapeutics, contact tracing, personal protective equipment, COVID-19 convalescent plasma, vaccinations, logistics, technology and other key areas. Within the Military Health System (MHS), a compelling example of the synergy that comes from this collaboration across our clinical communities is reflected in the development and publication of the DoD COVID-19 Practice Management Guide (version 7), an excellent resource that contains practice guidelines and studies for our providers.

We also recognize the tremendous work by General Gustavo Perna, United States Army, who led the federal response for accelerated development, manufacturing and distribution of vaccines. These efforts have resulted in the FDA issuing EUAs for three vaccines, and likely more to follow. Currently, our highest priority remains ensuring that all Sailors, Marines, and all DON personnel have access to the vaccine in order to protect themselves, their shipmates, their families and the community, consistent with the DoD prioritization schema. As the Navy Surgeon General, I have been clear in my guidance that inoculation with these vaccines, which is currently voluntary, is the most effective protection against this deadly virus.

Navy Medicine continues to answer the call to help our fellow citizens through medical surge support and vaccination support. In the early stages of this public health emergency, at the request of the Federal Emergency Management Agency (FEMA), Navy deployed both hospital ships, USNS MERCY (TA-H 19) and USNS COMFORT (TA-H 20), as well as personnel assigned to our expeditionary medical facilities, to support overwhelmed civilian hospitals, clinics and skilled nursing facilities in several states. Applying lessons learned, Navy Medicine quickly developed new adaptive capabilities with smaller acute care teams and rapid rural response teams, which proved effective in augmenting staff at smaller hospitals in medically underserved locations including Texas, New Mexico, and Arizona. Navy and Marine Corps personnel are now currently deployed to assist with vaccinations as part of the DoD Community Vaccination support. These personnel are administering vaccinations to fellow citizens in state-run, federally-funded community vaccination centers around the country. I had an opportunity to visit several of these teams and see firsthand the impact they are making in the lives of our fellow citizens most affected by the virus. To date, Navy Medicine has deployed over 6,000 active and reserve component personnel in support of operational COVID-19 missions.

PROJECTING MEDICAL POWER

Navy Medicine's COVID-19 response continues to project medical power. It is marked by grit, resolve and an unbreakable spirit. While battling the pandemic remains our primary line of effort, we remain fully engaged in all aspects of our mission; directly focused on improving our readiness and enhancing capabilities to increase survivability. These efforts include leveraging all dimensions of people, platforms, performance, and, power.

People: Recognizing that our dedicated and diverse workforce is our greatest strength, Navy Medicine published its Human Capital Strategy (2020–2025). This strategic framework provides a pathway to help ensure that our Force, active and reserve component personnel and Navy civilians, is structured to meet the requirements of evolving operational demands. It also requires us to optimize and align our talent management efforts placing right people in the right place with the right training at the right time.

Overall manning in each of active and reserve component officer Corps (Medical, Dental, Medical Service and Nurse) remains good; however, we continue to focus on shortfalls in critical wartime and readiness specialties to ensure we can meet our operational requirements in support of the National Defense Strategy. This emphasis is important given the need to assess and realign our uniformed personnel requirements and platforms to better support medical capabilities of the Naval Forces with the transition to Distributed Maritime Operations (DMO) and Expeditionary Advanced Base Operations (EABO). We are also prioritizing the need to increase mental health specialists assigned to the Fleet and Fleet Marine Force, and to quickly provide full spectrum force health protection in response to public health emergencies.

We must invest in recruiting, training and retaining our personnel. Continued accession and retention incentives are critical to the success of these efforts. Student accession programs are vital, considering Navy relies on USUHS and the Health Professions Scholarship Program for the vast majority of new Medical Corps accessions each year. Thank you for your continued assistance in this area, including the authorities contained in the FY2021 National Defense Authorization Act (NDAA) for increased special and incentive pays for officers in the health professionals.

For the Hospital Corps, manning for active and reserve component is at 99 percent and 95 percent, respectively. Similarly, efforts are targeted to shortfalls in critical wartime specialty Navy Enlisted Classifications (NECs), including Independent Duty Corpsmen (surface, submarine, dive and Fleet Marine Force reconnaissance). These highly trained independent providers are vital to delivering expeditionary medical support to Naval Forces operating forward. To this end, we launched a campaign to highlight the professionally rewarding opportunities in these challenging NECs and expanded the eligibility pool for qualified candidates. We also increased retention bonuses. In addition, USUHS approved the Independent Duty Corpsmen curricula for incorporation in their College of Allied Health Sciences which will allow these Sailors to earn college credits.

Navy Medicine civilians, a highly skilled workforce of approximately 11,500 professionals, are essential to our mission. They can be found throughout our worldwide enterprise delivering essential health care services—clinical care, research and development, public health and disease surveillance, logistics, and administration and much more. In addition to providing mentorship and training to our military personnel, they also provide much needed continuity in our facilities. We recognize that we face formidable competition with the private sector in attracting talented, highly qualified candidates, and we must work to recruit and expeditiously onboard these personnel. Expanded direct hire authorities provided in 2020 increased the number of specialties from nine to 27. Currently almost 55 percent of our civilian workforce is covered under these authorities which allows use of additional flexibilities for hard-to-fill health care positions. Again, we appreciate your support in helping us recruit the best and brightest. To date, Navy Medicine has transferred 40 Navy civilians to the DHA under transfer of function provision. We anticipate 150 additional employees will transition later this year.

Our priority is to have ready and confident personnel, with the knowledge, skills and abilities gained by experience and high velocity learning. The Navy Medicine Training and Education enterprise is critical to preparing our personnel for their warfighting mission. In spite of challenges posed by the SARS-CoV-2 virus, Navy Medicine maintained these capabilities and developed innovative solutions to mitigate interruptions, delays, and cancellations. Training commands, staff education and training departments, and operational training sites maximized use of virtual learning platforms, medical modeling and simulation, partnerships, cross-training, and blended learning to sustain ready medical forces. In 2020, we graduated 2,905 Hospital Corpsmen from basic “A” school and 1,235 students from advanced “C” schools, while 1,252 Hospital Corpsmen completed Field Medical Battalion Training. Directly supporting our maritime readiness, experts from the Navy Medical Modeling and Simulation Training program developed a mock shipboard training environment onboard the Medical Education Training Campus (METC). To date, over, 2,075 students have been trained in shipboard medical emergencies and mass casualty exercises utilizing this realistic operational training environment.

In addition, our nationally recognized graduate medical and health education programs are critical to Navy Medicine. I refer to this robust training as Navy Medicine’s “industrial base” since they are foundational to sustaining our pipelines to generate a proficient and combat credible medical force.

Our partnerships with leading trauma and academic medical centers are essential in helping our providers get the trauma volume, complexity and experience to maintain competencies to save lives at sea and on the battlefield. We continue to leverage our existing collaborative agreements with the James H. Stroger Jr. Hospital in Chicago, Illinois; the University of Florida Health Shands Hospital in Jacksonville, Florida; and the University Hospital Cleveland in Cleveland, Ohio. Earlier this year, we established a new partnership with WakeMed Hospital, a Level I trauma center in Raleigh, North Carolina, while continuing to support a relationship with the Cleveland Clinic to provide skills sustainment specifically for Independent Duty Corpsmen. Pre-deployment training for our teams continues at the Navy Trauma Training Center at Los Angeles County + University of Southern California. In addition, we are working closely with the University of Pennsylvania Health System in establishing a military-civilian partnership for trauma skills sustainment.

Inclusion and diversity are important components to a mission-ready Navy. Diverse, high performing teams provide us power, advantage and unity. We are a

stronger Navy because of our differences as we draw on the diverse culture, skills and perspectives of our shipmates. All of us recognize that we have more to do. These efforts must be consistently demonstrated through our behaviors and a commitment to achieving a Culture of Excellence grounded in our Navy Core Values of Honor, Courage and Commitment.

Platforms: Navy Medical personnel remain forward deployed with the Fleet and Fleet Marine Force. They are engaged in all warfare domains with the focus of keeping our Sailors and Marines ready and healthy to perform their demanding missions. To be effective, they must have optimized platforms and capabilities to deliver the full range of medical support, including combat casualty care at sea, rapid public health response, humanitarian assistance/disaster response, as well as Defense Support of Civilian Authorities missions.

To meet the demands of sustained operations at sea, Navy continues to develop new medical capabilities as well as to re-shape current capabilities to operate throughout the range of military operations. We recognize that Naval Expeditionary Health Service Support in the DMO environment requires modular and scalable capabilities able to provide theater hospitalization and forward resuscitative care, ashore and afloat. Additionally, we are focused on improved patient movement and enroute care capabilities, along with more dispersed holding capabilities to maximize survivability. An important priority currently in development is fielding a Role 2 Enhanced medical payload for the Expeditionary Fast Transport (T-EPF) Flight II, hull 14 currently under construction. Progress continues in support of our overarching deployable medical systems strategy with the direction and resource sponsorship of the Navy's Medical Systems Integration and Combat Survivability Office and in close collaboration with the United States Marine Corps.

It is also important to note that MTFs serve as important readiness training platforms. Within the MTFs, as well as through other partnerships, our providers get needed readiness-centric medical cases to keep their skills sharp and stay ready to deploy. Accordingly, our Navy Medicine Readiness and Training Commands (NMRTCs) provide the critical command and control for Navy Medicine personnel and ensure, through the Readiness Performance Plans, that our men and women have the clinical and operational currency and competency to support operational platforms such as hospital ships and expeditionary medical facilities. We work to ensure that we man, train and equip our personnel for current and future operations. These efforts continue to be impactful during the deployments of personnel from the MTFs in support of the COVID-19 medical and vaccine response. Furthermore, our overseas facilities function not only as vehicles for health care delivery, but more importantly as in-theatre pre-positioned medical capabilities that are critical components of Combatant Commanders' operational plans.

Performance: Navy Medicine's success is measured by those we serve, our Sailors and Marines. All of us recognize that it is necessary to ensure we provide well-trained personnel serving on agile platforms with the proper equipment sets; however, we also recognize that it is not sufficient. We must complement these efforts with relentless pursuit of applying the principles of a high reliability organization in all our actions, particularly in the operational forces. High velocity learning, rapid cycle feedback, and applying lessons learned are the underpinnings of our collaborative work to improve clinical outcomes and patient safety. Drawing on our high reliability successes in MTFs, we are rapidly moving to fully operationalize these tenets to improve warfighter readiness and increase survivability including the establishment of six operationally-focused clinical communities: female force readiness; psychological health; neuromusculoskeletal; operational medicine; trauma; and, dental services. This priority is also clearly evident in the whole of Navy Medicine response to the pandemic as led by our network of chief medical officers and others to rapidly assimilate and disseminate relevant clinical and scientific information and best practices throughout the enterprise.

It is critically important that our Sailors and Marines have access to mental health services, where and when they need them. Navy Medicine maintains a "no wrong door" approach to deliver prevention, early identification and evidence-based mental health treatment. Services are available world-wide in mental health specialty clinics, within primary care, at Navy and Marine Corps installation counseling centers, on the waterfront, and embedded within the Fleet and Fleet Marine Force to decrease stigma and ensure access to care for our Sailors, Marines, and their families. In 2020, embedded mental health (EMH) continued to expand with 35 percent active component mental health providers and 30 percent of behavioral health technicians assigned to EMH billets. MH providers are permanently assigned to support aircraft carriers, submarine forces, amphibious assault and surface combatant ships, Naval Expeditionary Combat Command units, Marine Corps Ground

Combat and Logistics Element units, and Navy and Marine Corps Special Operations.

Navy Medicine supports operations and readiness, collaborating with stakeholders on enterprise-wide strategies to address EMH manning, laydown, and practices, Disaster Mental Health, resiliency, suicide prevention efforts, and expansion of Operational Virtual Mental Health. Navy Medicine adeptly responded to new challenges presented by the pandemic through proactive mental health guidance, surveillance, and outreach, as well as rapid transition to virtual mental health modalities in MTFs and EMH. Mental health assets deployed across the Fleet to support COVID-19 related missions and increased operational tempo. This support included deploying a Special Psychiatric Response Intervention Team (SPRINT) to *THEODORE ROOSEVELT* during the COVID-19 outbreak. Navy Medicine continues to execute and expand the Caregiver Occupational Stress Control program to support psychological health and prevent burnout in Navy Medicine personnel, which may be particularly relevant during COVID-19.

We remain acutely aware of the impact of traumatic brain injury (TBI) on our Sailors and Marines. Services are provided through a network of TBI clinics with a range of care levels, including Intrepid Spirit Centers at both Camp Lejeune and Camp Pendleton, and larger programs at Naval Medical Centers Portsmouth and San Diego providing scalable, multidisciplinary, evidenced-based TBI care with a high return to duty rate. Programs at Camp Lejeune and Naval Medical Center Portsmouth offer TBI evaluation and treatment tracks specifically targeted at tip-of-the-spear warfighters who are at greater risk for sustaining TBI.

Supporting a medical ready force requires that we work diligently to improve the deployability of Sailors and Marines each and every day. Navy Medicine emphasizes the importance of completing a deployability assessment at every provider-based encounter. We also have made significant improvements to the management of our personnel on limited duty to include changing the assignment of limited duty from a fixed, prescriptive duration (180 days) to one that allows for the recommended recovery period to be determined by the specific medical condition for the service member. Navy Medicine is also refining algorithms within our information systems to better identify potential deployment limiting and temporary non-deployable conditions. All of us know that warfighting is inherently demanding and we need to do everything we can to support full recovery when a Sailor or Marine is injured or ill.

Recognizing the unique health care needs of our female Sailors and Marines, we developed our comprehensive Navy Medicine Female Force Readiness Strategy. The focus is to organize and coordinate efforts to increase medical readiness, resiliency, and retention in the female force and to improve comprehensive care delivery. We are prioritizing efforts to increase patient education, improve access to care and striving to ensure front-line provider proficiencies specific to women's health. To this end, we launched a pilot program to embed a women's health provider within care settings closer to operational units to increase service women's ability to resolve health concerns and minimize time away from duty. The pilot is in place at two Fleet sites, Naval Station Norfolk and Naval Station Mayport, and both are yielding promising results. We also published the Deployment Readiness Education for Service Women Handbook, a digital women's health education resource for active duty Marines and Sailors.

DON does not tolerate sexual assault. As part of Navy's Culture of Excellence, we continue to focus on developing and implementing prevention efforts while maintaining victim support and resiliency. Navy Medicine remains ready to respond to sexual assault by ensuring the availability of sexual assault medical forensic exams, ashore and afloat. We continue to provide responsive medical forensic care during the pandemic. Collaboratively, the Services sustained ongoing training by creating a virtual training platform for Sexual Assault Medical Forensic Examiner students to meet the requirements of the 80 hour multi-disciplinary course. These efforts helped ensure that we had the personnel trained to provide sexual assault care in both MTFs and operational settings. Despite COVID-19 restrictions, we trained 83 new medical forensic providers for total inventory of 167 serving across Navy Medicine platforms.

Navy Medicine continues to support the fielding of MHS GENESIS, DoD's modernized electronic health record. This effort is essential to our work to drive standardization, improve patient safety and foster high reliability within the MHS. From 2017 through March 2021, MHS GENESIS has been deployed to nine Naval facilities in Washington and California. Lessons learned from the earlier MHS GENESIS deployments have been applied to current sites and we are seeing substantive improvements in both training and implementation. We are fully engaged in joint implementation and optimization efforts in the fielding of MHS GENESIS and will

continue to work collaboratively with DHA and the other Services. Despite challenges due to the COVID-19 pandemic, significant progress has been made with implementation and the MHS remains on track to complete MHS GENESIS deployment by 2024.

Power: Navy Medicine's capability to project medical power is critical to increasing the survivability of Naval Forces, at sea and on the battlefield. Our contributions include providing the best combat casualty care along with rapidly addressing the threats that contribute to disease non-battle injuries. The global pandemic has demonstrated that we must be prepared to employ the full strength of our One Navy Medicine capabilities to protect the health of Sailors and Marines.

Our Navy Medicine Research and Development enterprise continues to demonstrate that it is responsive to operational requirements and is capable of providing rapid solutions for the warfighter. Collectively, their expertise in unique Naval environments provide high-value, high-impact knowledge and materiel products as evidenced by the significant contributions in battling the SARS-CoV-2 virus, including diagnostic testing, genome sequencing of potential viral variants and countermeasures development.

In addition, we conduct a range of research from basic research, applied research, advanced development, to testing and evaluation. Navy Medicine is engaged in work that directly supports Sailors and Marines, including advancing treatments of decompression sickness among diving and submarine personnel, providing research response to unexplained physiological events in tactical aircraft, and studying the impact of blast exposures on personnel. Due to the strategic location of labs, many projects involve infectious disease surveillance and international outbreak response enabling better understanding of global emerging health threats to military readiness.

Our partnerships with nations on six continents, U.S. academia, non-profit organizations and the private sector, along with access to a global network of scientists, allow for research focused on keeping service members healthy and ready.

Similarly, the Navy Marine Corps Public Health Center (NMCPHC) and its field activities continue to be on the vanguard of Navy's public health efforts in response to the COVID-19 pandemic. Their impactful contributions are reflected in all aspects of our strategy of prevention, mitigation, and recovery. Contributions include deploying public health and preventive medicine expertise on COVID-19-related missions to developing science-driven and evidence-based publications such as the "Playbook for Managing Coronavirus Disease 2019 in a Shipboard Operational Setting" which details management of SARS-CoV-2 outbreak with platform specific recommendations for sanitation, prevention and treatment. Their portfolio is broad and includes laboratory operations, environmental health, population health as well as preventive medicine. NMCPHC brings the unique and vast expertise that is sought after, and, more importantly, is valued by Navy and Marine Corps operational leaders.

Global Health Engagement (GHE) remains a critical element of global stability and national security, particularly in support of security cooperation by strengthening strategic partnership and alliances. Given its importance, GHE represents another important line of effort in support of projecting medical power. Our health security cooperation officers and global health specialists are working in support of Combatant Commanders, Navy Component Commanders as well as interagency and international partners. In addition, Navy GHE improves readiness, builds resiliency and provides competencies of our Navy Medicine personnel and prepares them to address an increasingly complex and interconnected world where health threats do not respect borders.

Given that our Naval Forces are operating forward around the world, we must continue to leverage the inherent power of Naval Virtual Health, applying technology to provide care and clinical consultations, without the constraints of time and distance. Our response to the COVID-19 pandemic served to accelerate our efforts as Navy Medicine used virtual health services, both operationally and in-garrison, to continue to support the operational readiness of Sailors and Marines during a time when access to face-to-face care diminished, and movement limitations impacted our personnel. We saw significant increases in virtual health visits in many areas, but most notably in mental health. This trend is very encouraging and signals that we are able to maintain important access to care for our patients, particularly given the stressors brought about by the pandemic. We are also working to expand virtual health reach in important readiness areas including periodic health assessments, deployment-related assessments, suitability screening and others. A key complement to our virtual health priorities is Navy Medicine's enterprise-level efforts to advance and integrate data and data analytics throughout our decision

making processes through capabilities such as machine learning, robotic process automation and metrics dashboards.

MOVING FORWARD

We continue the important work of MHS transformation. While the COVID-19 response necessitated an extended pause for many of these efforts, we have returned to planning and implementing the relevant Congressionally-directed reforms. Military Medicine's response to the pandemic provides us a meaningful organizational stress test to assess our capabilities and progress, essentially identifying what's working well, along with highlighting areas that need attention. Critical self-assessment and applying lessons learned derived from rapid cycle feedback are important as we build a high reliability organization.

Within the DON, our leadership recognizes the tremendous opportunity we have to refocus our efforts on medical readiness while transitioning health care benefit administration and management to the DHA, including direction and control of the MTFs. Properly executed, this construct will provide important opportunities to increase standardization, eliminate redundancies and favorably impact safety, quality and access within the MHS. In addition, it affords the DON capacity to focus exclusively on medical readiness and its unique responsibilities to provide a trained and ready medical force capable of operating in the maritime domain to meet their missions of Naval and Joint Forces.

To this end, our work continues to address the smooth transition of MTFs to the DHA as well as the key mission and functions of our NMRTCs in providing critical command and control structures for Navy Medicine personnel to meet Navy and Marine Corps missions. NMRTCs, at the local MTF level, will facilitate and reinforce the mutually supportive relationship between Navy Medicine and the DHA. Our goal remains to build an integrated system of readiness and health. While there is much work ahead, I see tremendous potential for military medicine to be a national model for health care high reliability and integration.

All of us in Navy Medicine understand the important responsibilities placed on us by the Nation to care for our Sailors and Marines who go in harm's way. Again, thank you for your support.

Senator TESTER. Thank you, Admiral, and thank you all for your testimony.

We are going to start with 5-minute rounds of questions.

Dr. Adirim, in your testimony, you talked about a \$1.8 billion shortfall, \$1 billion with TRICARE, \$800 million with military shortfall. Do these shortfalls impact the delivery of service of care to our servicemembers, retirees, or their families?

Dr. ADIRIM. Senator, our first priority is our healthcare to our troops and to their family members. That will never suffer any decrement whatsoever. That is our first priority.

And those numbers that I cited are projections that we are making. Currently, we have about \$673 million in costs that were not expected due to the COVID response, but we project that it will be over \$1.8 billion.

Senator TESTER. Okay. And so what are your plans to address these shortfalls? Does Congress need to step up?

Dr. ADIRIM. The Department is not planning to ask for a supplemental. We are looking to other programs within the DHP (Defense Health Program), such as sustainment, modernization funding. We will have to postpone facilities maintenance. We are looking for things like that, and we will likely have to look to the Department as well to fill these shortfalls.

Senator TESTER. So you are going to fill these shortfalls with transfers within the Department of Defense?

Dr. ADIRIM. We are currently now looking at how we can mitigate the shortfalls in any way that we can. It is a challenge.

Senator TESTER. Okay. I may come back to another question on that in a bit.

I want to talk about TRICARE. I am going to stay with you, Dr. Adirim. Can you tell me what impact the recent implementation of enrollment fees for TRICARE Select is having on the number of beneficiaries enrolled?

Dr. ADIRIM. Sure. I am not aware that there has been an impact due to any historical increase in fees. I can get you more precise information for the record if that is what you want, but I am not aware that there has been a decrement in our enrollment due to the fees.

Senator TESTER. So you are not seeing a decline in enrollment in TRICARE?

Dr. ADIRIM. Senator, I think I would like to take that for the record so we can get you a more precise answer.

[The information follows:]

EFFECT OF NEW ENROLLMENT FEES ON TRICARE PARTICIPATION

The overall decrease in TRICARE Select enrollments from December, 2018 to April, 2021 for Retirees and their family members who are not Medicare eligible and the corresponding increase in the number not enrolled in a TRICARE plan may be attributable to the statutory requirement that most Group A Retirees and family members pay TRICARE Select enrollment fees beginning January 1, 2021 and the availability of other health insurance (OHI) options to some of these beneficiaries.

There is certainly a correlation between implementation of enrollment fees and changes in the number of enrolled beneficiaries but an exact causation is more difficult to predict. If fees were not paid by early February, 2021, their existing TRICARE Select coverage was terminated for failure to pay enrollment fees, as required by statute. About 139,000 (15.9 percent) remaining Group A retirees and family members have until June 30, 2021 to request reinstatement of their TRICARE Select coverage if they desire to stay in TRICARE for the 2021 calendar year.

—Select Enrollment for Retiree & their family members who are not Medicare eligible fell by about 160,000 (18 percent) between December 2020 and March 2021, then went up by 10,000 in the April 2021 data. It is inferred that the increase in the April 2021 data was a result of beneficiaries paying fees and enrolling following the failure to pay notifications.

—Aside from the differences between the Select and Prime populations, one could conclude that other insurance options are available and there may be other reasons for enrollments (i.e. Medicare eligibility, change of address) to change over time. As an example, Prime Enrollment for Retiree and their family members who are not Medicare eligible dropped 18,000 (1 percent) between December 2020 and March 2021, then decreased another 3,500 from March to April.

Senator TESTER. Okay. That would be good.

In 2018, when the Military Health System was first beginning to implement reforms, we saw increases in TRICARE copays for specialty care, and this includes physical therapy and mental health, two treatments that are very common in military and veteran communities. Can you speak to the impact these increased copays have had on utilization of physical therapy and mental healthcare treatments under TRICARE?

Dr. ADIRIM. Sure. And again, Senator, I am not aware that there has been an impact on utilization of those services due to the copays, and I am happy to take that back too and get you a more precise answer. We can compare years for you.

[The information follows:]

EFFECT OF HIGHER COPAYS ON DEMAND AND ACCESSIBILITY OF MENTAL HEALTH SERVICES

With our data, we cannot estimate the impact that copay modifications had on the utilization of these therapies, as there are many factors which modify utilization rates.

For all behavioral health we saw increases in utilization in all years 2018–2020 for all beneficiary categories, though the rise in utilization was smaller for Retirees than Active Duty Family Members.

For physical therapy, there were increases in utilization for ADFMs in 2018–2019. In 2020 we saw increases in Prime ADFMs, but a slight decrease in Select ADFMs. In 2018 there were decreases in Retiree utilization, a similar increase in 2019, and a small decrease in 2020.

However, the data show that utilization of physical therapy for Prime Retirees fluctuated throughout 2011–2020, and not just the time period after implementation of NDAA 2017.

Senator TESTER. That would be good. I think it is critically important we know this. This is information that we need to know, and I will tell you why, because I am hearing about it on the ground in Montana. And if I am hearing about it, I am sure a lot of other Senators and Representatives are too.

Dr. ADIRIM. Sure, Senator. I am happy to bring that back.

Senator TESTER. Okay. So considering the reforms that have taken place, not to beat this mule anymore, but considering all the reforms that have taken place for TRICARE beneficiaries over the last 3 years, do you believe this benefit has retained the same level of historical value?

Dr. ADIRIM. Absolutely. I think it is a very rich benefit, especially when you compare it to the civilian sector. It is a uniform benefit. So all beneficiaries have access to the same benefit and menu of services that TRICARE offers.

I believe that with the new T5 Request for Proposal coming out and that new contract, that we will see even more benefits for beneficiaries.

Senator TESTER. Okay. I want to go back to the shortfall, the \$1.8 billion, and this is for the other folks who are here, the Surgeon Generals. Do you have any concerns about whether we are risking a shortfall? I mean, with this shortfall, that it is going to impact care to your troops?

Go ahead, General Dingle. We will just go down the line here.

General DINGLE. I will start it off, Chairman Tester.

So, as the Army looks at the operational force, what we do in conjunction with the Defense Health Agency and the Defense Health Agency and OCD (Office of Civilian Defense) Health Affairs, we identify our readiness requirements up front.

Right now, we do not have a shortfall, as we have worked through our readiness requirements as we identify those, but we will have to assess that as the fiscal year continues on.

Senator TESTER. But the answer right now is no?

General DINGLE. Correct. Yes, sir.

Senator TESTER. Okay. General Hogg?

General HOGG. Yes. So, along the same lines, Chairman, medical readiness of our force is paramount and number one, and so everything that we do will be directed toward that. At this point, yes, no shortfall.

I do, however, have a concern that as we move forward, if there is a shortfall, how that is going to get covered.

Senator TESTER. Yep, I gotcha.

Admiral Gillingham.

Admiral GILLINGHAM. Yes. Thank you, sir.

Like my colleagues, I think this is something that we will watch carefully and continue to work internally. At present, I do not see

a threat to our medical readiness, and as always, we will make sure that we provide most effective and high-quality care we can to our beneficiaries.

Senator TESTER. Appreciate that.

Senator Shelby.

Senator SHELBY. Thank you, Mr. Chairman.

Dr. Adirim and General Dingle, I will direct the first questions to you, both of you. As I noted in my statement, this committee continues to invest in medical research without regard to other similar Federal investments, it seems to me, at NIH, and maybe NIH is doing things you are doing better. I do not know that.

Can you answer the question that I posed in my opening remarks, which is this?: What specifically are Defense medical research dollars doing that NIH funding cannot or is not doing? I think that is an important question.

Dr. ADIRIM. Senator Shelby, I will start with this question, and I think that is a very good question.

We focus our research priorities within the Department on the warfighter and on the needs of the Joint Force and on those conditions which may greatly impact our troops.

We work very closely with the NIH and other agencies, coordinate very closely on research so that—

Senator SHELBY. What do you mean by working closely? Is that collaborative working together—

Dr. ADIRIM. Yes. Yes, we do.

Senator SHELBY [continuing]. On specific things? Name some of them.

Dr. ADIRIM. Sure. So, for example, for something like suicide and mental health, there is collaborative research that we work with NINDS (National Institute of Neurological Disorders and Stroke), have annual meetings on the research that comes out of both departments. The work groups work together to ensure that the research that is being done and sponsored by each department or together, because sometimes these research proposals come out of both departments are aligned to the requirements of our force.

Senator SHELBY. Ma'am, I realize, and I think we all do, that the military has certain needs that the general population does not need, but the military at the same time probably needs all of the needs and all the things that the general population in addition to the military specific things. Is that a fair statement?

Dr. ADIRIM. Sure. Yes, sir.

Senator SHELBY. So name your top three research areas that you are doing through the military research.

Dr. ADIRIM. Sure. I am going to turn it over to my colleague, General Dingle.

Senator SHELBY. Okay. General.

General DINGLE. Vice Chair Shelby, one of the things, to tag on to what Dr. Adirim was saying, the thing that the military also brings, as it takes the National Defense Strategy, the DOD guidance, and our service guidances, the focus is on the survivability of the soldiers.

Senator SHELBY. Absolutely.

General DINGLE. So prolonged real care in combat operations, trauma care, the latest technologies that we get from the civilian

sector or in NIH, but taking those civilian technologies, medical technologies, it takes that military service research and development to incorporate it into tomorrow's battlefield on how it is going to be incorporated in a multidomain environment. And I think that is one of the key things that we bring from the military as we couple with the civilian sector, academia, and the industry.

Senator SHELBY. Okay. In the area that we all see a lot of, that is, improvised explosive devices dealing with our military that is a traumatic thing. We see it with our soldiers and everywhere. Is there any connection between our efforts to detect and prevent that and the treatment of the victims, our soldiers, after they have sustained huge blasts?

General DINGLE. Yes, sir. And that is one of the beauties of what the Chief of Staff of the Army set up with our Army Futures Command, because it takes that prevention mode and the detection to get ahead of that blast, but then even if that blast happens, occurs, that is when the medical research and development piece comes in and we are studying those blast injuries and how to conserve and save lives.

So the short answer, yes, we are doing those preventive measures. It is all being done under Army Futures Command in which medical is incorporated across all of the cross-functional teams.

Senator SHELBY. Is there any correlation in research dealing with, say, trauma medicine, emergency medicine, domestically, civilian, and what the soldiers—you know, the soldiers are shot at. They are shelled. They step on mines. They do this, a lot of the civilians are shot at too much in the country, but I guess, the treatment of wounds, is there correlated research there, Doctor?

Dr. ADIRIM. Yes. And I am an emergency physician, and there is a number of research that has come out of the military that has—

Senator SHELBY. Absolutely.

Dr. ADIRIM [continuing]. Greatly benefited the civilian sector. I mean, I can name the REBOA, which is a device that is used in trauma. There is fresh frozen plasma, which is currently being used for battlefield, which will have civilian applicability. So, yes, you are exactly right. A lot of what we do within the Department of Defense, especially around trauma research, is applicable to the civilian sector.

Senator SHELBY. In the area of warfighter, our soldiers, sailors, and marines, Air Force readiness and their health, is there research going on between the military research and the NIH research regarding with the health of our people, the health of our soldiers? Of course, the soldiers are probably—not probably—are exposed to a lot different environments than the average American is.

Dr. ADIRIM. Well, Senator, as you alluded to, there are multiple domains of research that we do in coordination and collaboration with the NIH and a lot of which has applicability to the civilian sector and to the American people at large.

Senator SHELBY. Admiral Gillingham, I want to shift to the ambulance ship, transport ship.

The Navy recently issued a \$235 million contract modification to construct a multipurpose Expeditionary Fast Transport ship. Can

you talk about Navy Medicine adapting to Distributed Maritime Operations and specifically how the Expeditionary Fast Transport ship and ambulance ship will add value to those operations?

Admiral GILLINGHAM. Yes, sir. Thank you for this opportunity.

We are enormously excited about what is known as the EPF Flight II, which is the vessel that was previously known as the Joint High Speed Vessel, designed initially as a logistics ship.

In reviewing medical concept of operations for the Distributed Maritime Operations and Expeditionary Advanced Base Operations in support of the Marine Corps, recognized that we had a gap in the ability to respond quickly and much more quickly than we can with our Role 3 platform, the T-AH, or the hospital ship.

So the ambulance ship, as envisioned, will allow us to respond to ships in distress, ships that may have been damaged in combat, be able to assist in personnel recovery.

Senator SHELBY. It also gives you a lot of mobility on the water, does it not?

Admiral GILLINGHAM. Yes, sir. The speed is—it is a catamaran, bi-hull catamaran. It moves very quickly. It will allow an Osprey aircraft to land for medevac purposes. It will allow us—as envisioned and as being built and adapted with that additional funding, it will have an operating room that will accommodate two operating room tables, a room for 18 ICU beds, a medical-enhanced Role 3 medical staff of about 100 personnel.

We see this as filling a critical gap in the DMO (Defense MilPay Office) environment.

Senator SHELBY. Would you say this—fairly say this is a high priority for Naval Medicine?

Admiral GILLINGHAM. Yes, sir. It very much is.

Senator SHELBY. Thank you.

Thank you, Mr. Chairman.

Senator TESTER. Thank you, Senator Shelby.

We have Senator Baldwin virtually.

Senator BALDWIN. Thank you. Thank you, Mr. Chairman.

Dr. Adirim, how many cases of COVID-19 has the military seen this year and in 2020? And I also would like to hear the breakdown of the number of military personnel who have been hospitalized or who have passed away from COVID-19 since we first identified that threat.

Dr. ADIRIM. Sure. Thank you for that question. I do not have the precise numbers, and we can get those to you. But what I can say is having looked at our percent positivity and following the hospitalizations, it is much less than in the civilian sector, which is what you would expect for a younger, healthier population.

Currently, right now, we are seeing a test positivity rate of about 4.4 percent, and it is 6 percent out in—nationally. So we have a lower case rate than we see out in the civilian sector, and we have lower hospitalization rates as well.

But I will get you those precise numbers for the record.

[The information follows:]

STATISTICS ON COVID-19 INFECTIONS/HOSPITALIZATIONS/DEATHS WITHIN THE TRICARE
POPULATION

	All beneficiaries			Active duty		
	Direct Care	Private Sector Care	Total	Direct Care	Private Sector Care	Total
All COVID + ...	220,377	257,464	477,841	133,866	33,370	171,807
Hospital admissions	5,171	37,941	43,112	948	750	1,698
Deceased	262	10,018	10,280	7	37	44

Senator BALDWIN. I will appreciate that.

How many anthrax cases has the military seen over the same period of time?

Dr. ADIRIM. Ma'am, I am not aware of anthrax cases.

Senator BALDWIN. Okay. Are you aware of potential anthrax exposure incidents that the military has experienced in the last year or the last 5 or 10 years?

Dr. ADIRIM. Ma'am, I would not have that information. I can ask one of my Surgeon General colleagues if they might know the answer to that.

Senator BALDWIN. Does anyone have any information about anthrax exposure or cases in the last decade?

General DINGLE. Senator, This is Lieutenant General Dingle.

We do not have that information on us. However, we do have a very detailed Environmental Health Surveillance Registry, which that information is documented in. We would have to take that for record to come back to you to provide you those details.

[The information follows:]

STATISTICS ON ANTHRAX INFECTIONS/HOSPITALIZATIONS/DEATHS WITHIN THE TRICARE
POPULATION

The military has not had any cases of anthrax this year and in 2020. There were a number of laboratory-based exposures in 2015 where individuals were treated with antibiotics and vaccinations. While there have been limited cases of potential anthrax exposure due to naturally occurring disease or laboratory incidents, the DoD maintains the requirement for anthrax vaccination in our personnel to counter the threat of the use of anthrax as warfare agent, to include use in bioterrorism. The advancement of biotechnology only increases this risk, and this is a validated threat for both DoD and the larger U.S. Government.

Senator BALDWIN. Okay. Does the Department of Defense plan to continue procuring anthrax vaccines moving forward, and if so, how many?

Dr. ADIRIM. Senator, the anthrax is still considered a threat to our forces. Other governmental agencies as well has determined that anthrax is a threat. So to answer your question, it is yes. We do plan to protect our forces from those threats.

Senator BALDWIN. Okay. I think you can get a sense of the point that I am trying to make. There has been a lot of concern over vaccine declination rates for COVID-19 vaccines. There has also been a long history of concern over compulsory vaccinations, including for anthrax, beginning in the—towards the end of the 1990s. I would like to hear details on how the DOD has increased voluntary participation in vaccines in the past, and how does the Department approach making decisions about whether vaccinations should be compulsory for our servicemembers?

Dr. ADIRIM. Right. Thank you for that question.

And I can talk about COVID because we are doing a lot with regard to helping our servicemembers make their decisions about taking the vaccine.

As you know, under EUA (Emergency Use Authorization), the vaccine is voluntary, and we are using every avenue possible to provide information, social media, and town halls. We have MTF physicians available to answer questions. We do Facebook live sessions. We put information on websites in order to provide accurate information about the vaccine, and as you alluded to, we do not have a perfect acceptance rate.

We do not know what the declination rate is, really, because we only just yesterday opened up vaccination to all eligible beneficiaries. But we do track this, and we are very interested in helping our servicemembers and other beneficiaries make the decision to get vaccinated.

Senator BALDWIN. Dr. Adirim, you stated in your testimony that the greatest proximate challenge to our Nation's security is the threat of COVID-19, and I asked about anthrax because I am concerned that our spending priorities are not aligned with both current and emerging threats.

We have known that a pandemic based on a novel virus, that it would attack the respiratory system, could cripple our country, and yet we did not purchase PPE (Personal Protective Equipment), and we did not reassure manufacturing of critical medical supplies or vaccines, yet 2020 saw one of the largest purchases of anthrax vaccines, a threat that to my knowledge has not been included in annual worldwide threat assessments or highlighted in testimony to the Congress in many years.

And from 2015 through 2020, we spent about \$1 billion on anthrax vaccines, even though many experts, including Dr. Fauci, have suggested that the best approach towards anthrax is antimicrobial therapy.

I understand the continued need to monitor this thread, but it does seem to me like we have prioritized the requirement for this vaccine at the expense of preparing to protect our servicemembers and families against things like global pandemics. So I am looking forward to following up on my line of questioning.

Thank you.

Senator TESTER. Thank you, Senator Baldwin.

I only have one request, and then we will close this hearing out. And it is for Dr. Adirim. I would like to have you get to me and the committee, the research that is being done in respiratory ailments as it applies to burn pits, and I would ask that you be specific on the respiratory ailments that you are looking at. It is a big, big, big issue that has got some legs, this Congress, as far as providing benefits to our veterans.

[The information follows:]

HEALTH ISSUES ASSOCIATED WITH BURN PITS

The Department of Defense (DoD) and the Department of Veterans Affairs (VA) have funded many research studies related to the possible respiratory effects of airborne hazards in theater, including burn pit exposure. Many studies have been published on the relationship between exposure to airborne hazards and respiratory conditions, including: respiratory symptoms (chronic cough, dyspnea (shortness of breath), and wheezing); asthma; COPD (chronic obstructive pulmonary disease, that is, chronic bronchitis and emphysema); constrictive bronchiolitis; and several other

lung diseases, such as sarcoidosis. DoD is currently funding human health studies on the relationship between burn pit exposure and the following conditions: respiratory symptoms; asthma; chronic bronchitis; constrictive bronchiolitis; and several other lung and cardiovascular diseases. VA is currently performing a long-term mortality study of veterans of Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF), which will evaluate the death rates due to several types of lung diseases and several types of cancer. The National Academy of Sciences (NAS) is a nationally recognized organization that is independent of the Federal Government. The NAS published a comprehensive 270 page report in September 2020, entitled “Respiratory Health Effects of Airborne Hazards Exposures in the Southwest Asia Theater of Military Operations.” The NAS reviewed hundreds of health studies related to airborne hazards in theater, including studies funded by DoD, VA, and non-Federal sources. The NAS report evaluated the scientific evidence on 27 respiratory health outcomes, including all the diseases mentioned previously. The NAS report concluded there was limited evidence that there is an association (relationship) between exposure to airborne hazards in OIF/OEF and respiratory symptoms of chronic persistent cough, shortness of breath, and wheezing. DoD and VA are continuing to fund multiple human health studies to develop more definitive evidence on the relationship of exposure to airborne hazards in theater and long-term health effects.

ADDITIONAL COMMITTEE QUESTIONS

Senator TESTER. I want to thank Senator Shelby and Senator Baldwin for their questions today. I want to thank you for your testimony today. The witnesses know that Senators may submit additional written questions, and we ask you to respond to them within a reasonable time.

[The following questions were not asked at the hearing, but were submitted to the Department for response subsequent to the hearing:]

QUESTIONS SUBMITTED TO DR. TERRY ADIRIM

QUESTIONS SUBMITTED BY SENATOR RICHARD J. DURBIN

Question. This Subcommittee has long prioritized life-saving medical research—it improves our military edge, protects our service members and their families, and produces real, tangible benefits for all Americans.

As the Defense Health Agency works toward a larger role in defense medical research, how do you plan to ensure that the effort continues to prove its value?

Answer. DHA recognizes the long history of Research, Development and Acquisition (RDA) accomplishments made within DoD. DHA seeks to continue that history with support to the vital DoD research enterprise in advancing the delivery of capabilities to the warfighter and beneficiaries through support to elements such as the Congressionally Directed Medical Research Program that fosters synergy with academia, industry and other Federal agencies and continued support to CONUS and OCONUS DoD laboratories. As DHA takes on a larger role in the defense biomedical research enterprise, metrics will be captured that will demonstrate the value of a consolidated enterprise medical research organization.

Question. Over the years, DoD has leveraged civilian partnerships to stretch limited dollars wisely and maximize research efforts, direct care, and military readiness. For example, DoD has successfully partnered with academic institutions on trauma training, through engagement on various programs as well as even assigning military medical personnel to civilian trauma centers. And in fiscal year 2019, Congress created a new pilot program to treat members of the Armed Forces for psychological conditions—such as PTSD—stemming from military sexual trauma, with the idea being that DoD should partner with civilian institutions for this effort. As we know, sexual assault can be a significant source of trauma stress for service members and their families. And while service members can and do receive adequate care within the Department, it is to DoD's advantage to have outside treatment options available to accommodate service members, where public stigma has too long been a barrier to care. However, I have been disappointed that in implementation of this new pilot, for which Congress has appropriated \$9 million between fiscal year 2019 and fiscal year 2021, DoD has yet to choose a civilian academic medical center to participate.

Please elaborate on the benefits of civilian partnerships within the defense health program and provide some examples.

Answer. The defense health program (DHP) engages in civilian partnerships to address emerging needs that are not able to be met by existing government capacities. Civilian partnerships are most valuable when they provide expertise and/or programmatic capability that the government cannot feasibly or efficiently deliver in the timeline needed. Several examples are noteworthy. In 2010 the DHP funded and established the Military Suicide Research Consortium (MSRC). The MSRC leverages civilian scientific expertise as well as DoD capabilities to study the causes and prevention of suicide. Suicide etiology and prevention are complex scientific fields with substantial research gaps that cannot entirely be met by existing internal defense health program efforts. The military's Alcohol and Substance Abuse Disorder Research Program (ASADRP) expedites the identification of therapeutic compounds for the treatment of alcohol and substance use disorders through the multidisciplinary expertise of researchers from both the DoD and the civilian sector, most notably the University of California San Francisco and the Research Triangle Institute. The Study to Assess Risk & Resilience in Service members Longitudinal Study (STARRS-LS) benefits from a broad DoD/civilian partnership to address behavioral health issues in the military. The STARRS-LS collaboration taps the diverse skills of investigators at numerous research institutions including Uniformed Services University of the Health Sciences, the University of California at San Diego, Harvard Medical School, and the University of Michigan. In addressing treatment needs associated with military sexual assault and sexual harassment, the VA/DoD Women's Health Working group has also engaged with civilian partners with subject matter expertise from the School of Medicine at the University of Colorado-Denver and the University of Washington.

DoD outreach campaigns to support transitions and reduce stigma also significantly benefit from collaborative partnerships with academic, industry, and civilian organizations. For example, the inTransition program and the Real Warriors Campaign make dedicated efforts to engage and foster collaborative partnerships with the Elizabeth Dole Foundation, Washington Nationals Baseball, Sesame Workshop, Give an Hour, Army Wife Network, Operation Homefront, Emory University Healthcare Veterans Program, General Electric, George Mason University, the University of Texas, and the American Red Cross.

If the government has the capability and expertise to complete the mission, external partnerships may not be warranted. Internally conducted government projects ensure that incentives are aligned with internal needs and priorities, with minimal financial or scientific biases. Sometimes, however, contributions from civilian partners can add knowledge, resources, scope, and efficiencies that DoD alone cannot offer. Ultimately, the choice whether or not to work with external partners is determined by the availability of expertise, the maturity of the scientific and programmatic field, and the timeline for delivery.

Question. How has DoD used the appropriated funds for the implementation of the MST pilot, and how do you intend to use the fiscal year 2021 funds?

Answer:

—Healthcare Cost Impact: Actual healthcare costs are not available due to claims lag. Based on the current participation rate (43 participants as of 4/30/21), it is projected that DoD will execute the full amount of \$174,000. The pilot ends 8/31/21 with last admission to the pilot program on 7/31/21.

—Administrative Cost Impact: The total administrative cost as reflected in the definitization modifications of the contracts is \$200,059. The contractor's proposal costs came in lower than the Independent Government Cost Estimate (IGCE), therefore, lower costs were negotiated.

—Related tasks/adjustments: Based on the current participation rate, it is not expected that there will be higher enrollment as projected. Therefore, DoD cannot execute \$297,000 for related tasks or adjustments as indicated in previous spend plans.

Question. How does DoD plan to expand its civilian partnerships when it comes to the MST pilot, and will there be an opportunity for academic medical centers to participate?

Answer. Section 702 of the NDAA for fiscal year 2019, authorized a pilot program to treat psychological sequelae associated with sexual assault to be accomplished through partnerships with public, private, and non-profit healthcare organizations and institutions. These partnership institutions must provide healthcare to TRICARE eligible members of the Armed Forces (including National Guard and Reserve). The pilot program is focused on treatment of Service members suffering from psychological health conditions associated with sexual assault including PTSD, substance misuse and depression. The pilot is designed to assess the feasibility and ad-

visability of DoD-wide implementation of a DoD/civilian partnership model utilizing the IOP treatment format.

All academic and private civilian intensive outpatient programs were eligible to participate in the pilot if they met TRICARE standards and were TRICARE certified (based on TRICARE Operations Manual chapter 6010.59–M, Chapter 18, Section 8). Despite an open call for partners across civilian and academic medical centers, no academic medical centers applied for TRICARE certification.

Civilian partner IOPs were selected in September 2020. To date, five TRICARE-certified intensive outpatient programs have enrolled in the pilot as well as two DoD intensive outpatient programs. All civilian partner IOPs have been engaged and are in active data collection.

Enrollment numbers are in line with expectations overall, but the Humana sites have lower enrollment (Humana = 2, Healthnet = 41, DoD = 133). PHCoE has engaged in several efforts to increase enrollment in civilian sites. PHCoE met with THP and Humana clinics to review implementation procedures and problem solve, DHA Communications was engaged to increase awareness of pilot among end users, and Humana has plans to pivot to 100 percent telehealth in an effort to mitigate travel concerns.

Civilian Partner IOP programs include:

- Oceans at Waco, TX
- Oceans at Biloxi, MS
- Help for Heroes at Denver Springs, CO
- Strong Hope at Salt Lake Behavioral Health
- Aurora Behavioral Health at San Diego

Due to data collection being underway at all DoD sites and civilian partner sites, no additional sites are projected to be added to the pilot prior to its completion in August 2021.

Question. I am pleased that the Defense Health Agency (DHA) chose the Army's Civilian Human Resources Agency (CHRA) as its provider of human resource support. I worked to ensure that CHRA, based at Rock Island Arsenal, was the primary office responsible for supporting DHA's human resource needs. I recognize that COVID placed a hold on hiring of many positions within the Department of Defense and, to date, only about 50 positions have been filled at Rock Island in support of the DHA contract.

Can you detail for me when you expect the freeze on civilian hiring to be lifted?

Answer. There has not been a freeze on civilian positions in the DHA. The DHA leverages all available human resource authorities to fill positions above the MTF level that include: Transfer of Functions, Management Directed Reassignments and competitive hiring since CHRA became the Human Resource Service Provider to the DHA.

Question. Further, can you detail how many additional positions you expect CHRA to hire in order to support DHA requirements?

Answer. The DHA has in excess of 450 civilian positions being actively recruited through CHRA. There are over 310 additional vacant positions available to the DHA for recruitment.

Question. I understand the importance of the on-demand blood program and its potential benefit to readiness and addressing critical supply challenges.

Can you elaborate on the anticipated funding for the program this current fiscal year as well as into the FYDP?

Answer. The total funding for this program is \$110 million over 5 years. To date the program has received \$15 million (fiscal year 2019; Year 1) and another \$12 million (fiscal year 2021, Year 2; pending award) this year for a total of \$27 million.

Question. Can we expect future budget requests to seek making this program a program of record within the Department of Defense? Why or why not?

Answer. Currently the On-Demand Blood (ODB) program and its host, the USU-4D Bio3 Center for Biotechnology, are not Programs of Record and rely on annual budget funding prioritization. The ability to manufacture clean blood products near the point-of-need, even austere environments, could mitigate blood supply vulnerabilities not only for our warfighters deployed overseas but also for our Nation as reported in the 2020 HHS Report to Congress: Adequacy of the National Blood Supply (attachment). This report highlighted multiple challenges with sustaining the National Blood Supply that are particularly problematic during national emergencies such as the current COVID-19 Pandemic. With this program, we hope to mitigate the various National Blood Supply vulnerabilities by creating an alternate source of clean blood to traditional blood donation, not only for our Warfighters but also for the Nation and Global Health Community.

Question. Has DoD done enough with interagency partners and the scientific community to address concerns? What type of interagency collaboration is occurring with this project?

Answer. The USU-4D Bio3 ODB program consists of collaborations with the FDA, Harvard/Massachusetts General Hospital, as well as three industry partners. The program is also in partnership discussions with other Federal agencies, to include National Institutes of Health (NIH), Armed Service Blood Program (ASBP), Assistant Secretary for Preparedness Response (ASPR), Biomedical Advanced Research and Development Authority (BARDA), Federal Emergency Management Agency (FEMA), National Institute of Standards and Technology (NIST), National Aeronautics and Space Administration (NASA), and the UK Ministry of Defense and Innovate UK.

Question. Does the Department of Defense have plans to develop a demonstration of on-demand blood in a real world training scenario like any of the major training exercises in the Pacific?

Answer. Yes, in conjunction with USU-4D Bio3's Fabrication in Austere Military Environments (FAME) Program, it is our goal to conduct demonstrations of the On-Demand Blood program's capabilities to fabricate blood in austere environments. Currently, we are also exploring development of autonomous means to provide blood in theater. The team is in discussions with leadership of the ASBP and individual COCOMS to determine a transitional training scenario for fiscal year 2022/2023 as the bioreactor technology that fabricates the blood products will be ready for in-field testing/deployment at that time.

Question. I am concerned that there has been significant decrease in DHP core neurosensory research especially in vision-ocular trauma intramural funding that decreased from fiscal year 2019 \$5.8 million under the JPC-8 Army Medical Material Research Command (MMRC) in the core vision research funding to \$1,000,000 for fiscal year 2020 and fiscal year 2021 with no further funding fiscal year 2022 to fiscal year 2025. This leaves military trauma ophthalmologists with no internal trauma research funding, despite wounded warrior research remaining a priority at DoD.

Please provide the amounts that DHP has funded for core trauma research funding for sensory injuries, including vision and hearing, TBI, orthopedic, and spinal cord injury research for fiscal year 2021. What is projected for fiscal year 2022 for each?

Answer.

Planned RDT&E Funding for Trauma Research

Research Area	Fiscal Year	
	2021 (\$k)	2022 (\$k)
Vision	\$—	\$—
Hearing	\$10,538	\$7,587
TBI	\$105,065	\$47,272
Orthopedic	\$19,641	\$19,511
Spinal Cord	\$4,272	\$2,377
Other (non-specified)	\$71,107	\$59,686
Total	\$210,623	\$136,433

QUESTIONS SUBMITTED BY SENATOR PATTY MURRAY

Question. As you know, the Department of Defense has a long standing need for agents to prevent disease and death caused by plague and botulinum toxin, with the Department of Homeland Security issuing a Material Threat Determination in 2004 for both of these diseases. However, funding for these two vaccines under the Joint Vaccine Acquisition Program (JVAP) were zeroed-out as a result of the fiscal year 2021 Defense-Wide Review despite significant previous financial investment and completion of both Phase 1 & 2 clinical trials. Why are these programs being cancelled without alternatives in place? Will the Department propose other avenues to ensure servicemembers are not at risk?

Answer. While OASD(HA) supports the Warfighter and all DoD personnel for all health aspects, we would have to defer questions on the development of counter-measures against manmade threats such a plague and botulinum toxin to the Office of the Assistant Secretary of Defense for Nuclear, Chemical and Biological Defense

Programs. OASD(HA) is a stakeholder within the Chemical and Biological Enterprise, but we do not have control over the resourcing and developmental decisions in this space.

QUESTIONS SUBMITTED BY SENATOR JEANNE SHAHEEN

Question. The Biden Administration has reported that National Institute of Allergy and Infectious Diseases (NIAID) is examining the durability of the immune response and that the National Institutes of Health (NIH), Centers for Disease Control and Prevention (CDC), and Department of Defense (DoD) are assessing whether vaccine-induced immunity, or natural immunity from prior infection, can be effective in combating COVID 19 emerging variants. T cell testing has been integrated into the United Kingdom COVID immune response assessment.

What are your views on the need to measure immune response?

Answer. The Department believes it critical to understand the immune responses to COVID vaccination (and wild-type disease) to establish a known correlate of protection. This will help improve diagnostics and vaccines and help drive the future efforts to combat this disease.

Question. What role do you see for T cell mediated response being integrated into vaccine efficacy assessments at DoD?

Answer. The Department supports further study of the T cell compartment, as various studies have shown differing results between the B cell and T cell compartments, to include distinct kinetics.

Although T cell tests are not routinely used clinically, they do provide extremely valuable insight to ultimately determine efficacy of some vaccines. We are committed to continued collaboration/partnership of DoD with national efforts. An Uniformed Services University/Infectious Disease Clinical Research Program protocol proposal is just one example of that commitment.

QUESTIONS SUBMITTED BY SENATOR SUSAN M. COLLINS

Question. At the beginning of the COVID-19 pandemic last year, the nation saw a huge spike in demand for modular negative pressure room containment systems that can offer civilian hospitals or Military Treatment Facilities the capability to safely assess and treat patients with suspected COVID-19 symptoms. It is clear these commercial-off-the-shelf systems can help ensure the readiness of the defense health system worldwide, especially in the case of future pandemics or biological attacks. Section 732 of the recently enacted fiscal year 2021 National Defense Authorization Act (NDAA) requires a report of the Department's pandemic preparedness. I was pleased that the Department has committed to ensuring that these modular negative air pressure room containment systems are included as part of that Pandemic Preparedness Report directed by the NDAA. Provisions unanimously approved in the Senate's fiscal year 2021 NDAA bill also required a specific review of these systems.

Given the use of these systems in the civilian sector and in VA hospitals, what does the DoD believe to be the potential benefits of these systems?

Answer. Although there is limited published literature that provides a comparative analysis of modular negative air pressure room systems to traditional structures, such systems have demonstrated value in specific situations and environments. Specifically, these systems are believed to create a negative pressure environment designed to contain airborne infectious pathogens with minimal assembly time and disruption to permanent facility structures. One unique system with demonstrated success is the USTRANSCOM/Air Mobility Command developed Negatively Pressurized CONEX and CONEX Light (NPC, NPCL), which allows the transport of critically ill patients with highly contagious diseases aboard pressurized, military cargo aircraft. The CDC highlights the fact that inadvertent exposure to airborne pathogens can result in significant morbidity and/or mortality and the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) has emphasized that disease outbreaks (i.e., epidemics and pandemics) are increasing in frequency and reach.

Question. How could these types of systems be used by DoD in the future to help mitigate the spread of future pandemics or biological agents in the future?

Answer. Understanding that some facilities and environments may not be conducive to construction of permanent fixtures, modular negative air pressure room systems have the potential to serve as an alternative solution for pathogen containment. Integration of such systems is most applicable in situations where facilities are at risk for operating beyond surge capacity (e.g., uniquely positioned OCONUS

facilities) and therefore emergency preparedness should be directly aligned to each facility's risk assessment. ASHRAE supports such statements and emphasizes that, Mitigation of infectious aerosol dissemination should be a consideration in the design of all facilities, and in those identified as high-risk facilities the appropriate mitigation design should be incorporated.

Given the unique mission of the DoD, integration of innovative solutions such as the NPC/NPCL is critical for effective emergency preparedness with broad-scale applicability, including protection of personnel from pathogens during humanitarian relief operations. Decision-making regarding any emergency preparedness strategy must consider the evolving nature of biologic threats and therefore integrate a multi-layered systems approach in collaboration with bioenvironmental engineering.

QUESTIONS SUBMITTED BY SENATOR LISA MURKOWSKI

Question. A multitude of studies indicate that those who have served in the military are at a much greater risk of developing ALS (ALS, or amyotrophic lateral sclerosis, is a progressive neurodegenerative disease that affects nerve cells in the brain and the spinal cord) and dying from the disease than those who have no history of military service. I was pleased that \$40 million in funding was provided to the Congressionally Directed Medical Research Program (CDMRP) for peer-reviewed ALS research for fiscal year 2021. Support for this research has been a long-time priority of mine, and an issue that is near and dear to my heart.

Do you believe enough research on ALS is being done through the DoD's Peer Reviewed Medical Research Program (PRMRP)?

Answer. The annual appropriation for the Peer Reviewed Amyotrophic Lateral Sclerosis (ALS) Research Program (ALSRP) has grown from \$10 million in fiscal year 2019 to \$20 million in fiscal year 2020 to \$40 million in fiscal year 2021, totaling \$149.4M since the program was established in 2007. With a focus of expediting the pipeline from bench science to new clinical therapeutics, historically, the ALSRP has offered awards in the areas of "Therapeutic Development" and "Therapeutic Ideas," with maximum awards up to \$1 million and \$500k in fiscal year 2020 respectively. This has resulted in 84 awards made through fiscal year 2019 and currently 19 awards made against the fiscal year 2020 appropriation.

The Therapeutic Development award mechanism supports post-discover validation and development of candidate therapeutic agents through the steps required prior to FDA approval as an Investigational New Drug (IND). The Therapeutic Idea award mechanism supports high risk/high reward hypothesis-driven therapeutic ideas in an early stage of development. In fiscal year 2020, a third category, "Clinical Development" was introduced with a maximum award of \$300k. This category of award is designed to support leveraging of patient-based ALS resources to define subtypes, predict therapeutic responses, improve the value of ongoing clinical trials, and/or optimize the components of current ALS clinical care.

Question. Do you anticipate that an increase in funding will be needed to continue research under the new realities that the pandemic has imposed on us?

Answer. The cost of research is always increasing due to inflation. The ALSRP adjusts the number of awards made in order to fund scientifically and technically appropriate research that provides the greatest impact in support of the programmatic vision established by the Programmatic Panel as part of the five-step process for soliciting, reviewing, and funding research. As an example and as described in the question above, the increase to \$20 million in fiscal year 2020 enabled a new award mechanism to be established.

QUESTIONS SUBMITTED BY SENATOR JERRY MORAN

Question. Dr. Adirim states in her written testimony that Joint VA/DoD Clinical Practice Guidelines (CPGs) have been formulated for provider use for all major clinical conditions in mental health. However, there are not any current CPGs available that address serious mental illness (SMI) and conditions such as bipolar disorder and schizophrenia. In Public Law 116–171 Sec. 304, Congress directed DoD and the Department of Veterans Affairs to work together to develop current CPGs that address these SMI conditions.

Can the Department please provide an update on the establishment of the work group directed by Congress in this Act in order to begin the development of the SMI CPGs?

Answer. The VA and DoD are collaborating on two new VA/DoD CPGs that address serious mental disorders, one for schizophrenia and the other for bipolar disorder. Both VA and DoD teams have secured working group members and are

awaiting on final arrangement with the VA contractor to start the work. A new CPG usually takes anywhere from 12–18 months to complete.

Question. Dr. Adirim, I continue to have concerns in regards to the high rate of suicide among our service members in the 1 year period post-transition. In your written statement, you mention that the Department and VA are currently working together to develop a Separation Health Assessment which will feature a Mental Health Assessment.

Can you provide any more detail on what this Mental Health Assessment will include?

Answer. The Mental Health Assessment (MHA) of the Separation Health Assessment (SHA) will have five components. These components are (1) The PC-PTSD-5, a screening instrument for PTSD; (2) The Patient Health Questionnaire (PHQ)-2, a screening instrument for depression; (3) The AUDIT-C, a screening instrument for alcohol use; (4) The Columbia Suicide Severity Rating Scale (C-SSRS) Screener, a screening instrument for suicide risk; and, (5), A 2 question screening instrument for violence risk.

Question. Further, do you have an estimated timeline for when this assessment will be rolled out to service members?

Answer. The Department anticipates that the SHA will be implemented in late 2022.

Question. How will the DoD and VA share information to make certain recently-separated individuals receive the care they require?

Answer. The DoD and VA will utilize the Electronic Health Record (EHR) to share information to make certain recently-separated individuals receive the care they require. Additionally the DoD's inTransition program and the VA's Military and Veterans Crisis line have integrated efforts to provide improved, comprehensive support for service members. The inTransition program works closely with the MVCL to connect callers with follow-up treatment after receiving crisis care at a military or civilian emergency department.

Question. There is a somewhat long and complicated process for active duty service members in allied healthcare occupation specialties to receive approval and funding for professional credentialing opportunities. This leaves service members unable to translate their military training and experience into skills and qualifications required by private sector healthcare employers. As the COVID-19 pandemic puts an increased burden on the healthcare workforce, improving the credentialing process seems like an easy way for DoD to assist in this space while helping thousands of service members transition to civilian life.

Does the Department have a strategy to assist the service branches to fund and strengthen the credentialing process, such as through DHA's Education and Training Directorate?

Answer. This question primarily concerns enlisted service members in the MHS, thus this answer focuses on the Medical Education and Training Campus (METC) and the work it does to both enhance the skills and education of our enlisted healthcare personnel while also assisting them in obtaining credentials that translate to the civilian sector upon separation or retirement. The METC offers 48 enlisted education and training programs and is accredited by the Council on Occupational Education (COE). METC's institutional accreditation qualifies individual programs to obtain specialized or programmatic accreditation. Both institutional and programmatic accreditation are prerequisite to students earning a certification, or a professional license.

The METC has 14 accredited programs and five non-accredited programs that generate a student certification or license.

In addition to maintaining institutional and programmatic accreditations, the METC is a branch campus of the College of Allied Health Sciences (CAHS) under the Uniformed Services University of Health Sciences (USU). The METC/CAHS branch campus is currently comprised of 15 enlisted training programs, all of which have Associate of Science in Health Sciences (ASHS) degree plans.

Students attending programs that are part of the METC/CAHS branch campus receive a USU transcript with credit hours for successfully completed course work. Credit hours can be applied toward the programs' established degree plan, or transferred directly to the student's choice of school. All 48 enlisted medical education and training Programs have an avenue to receive college credit which can be transferred directly to colleges or universities, or applied to a bridge school program.

The METC also partners with colleges and universities to offer Bridge Degree Programs. This program offers pathways to college degrees and certifications by giving credit for military education and articulating the credit into a career/college degree pathway. Currently, METC has 89 Bridge Degree Partners and over 1400 degree bridge pathways. This program saves both enlisted service members' and vet-

erans' time and money, and makes the possibility of earning a college degree more attainable. Colleges and universities that wish to become a bridge partner express interest and then navigate a streamlined 8-step process that usually includes a campus tour, curriculum crosswalk, a question and answer session via email or other venues, a proposal of transfer credits, feedback from METC program directors, and acceptance of the proposal and bridge pathway that signifies an informal partnership. Degree bridge programs, plans, or pathways illustrate the courses military members must complete to earn a specific college degree after transfer credits have been authorized. Maintenance and expansion of these partnerships and pathways are vital to the well-being of veterans and their families and saves the DoD millions in education related costs. This program is at no-cost to the government and free to the service members receiving transferable credit. The only cost occurs when the service member attends the institution of choice to complete the remaining degree requirements as spelled out on the degree pathway.

QUESTIONS SUBMITTED BY SENATOR JOHN HOEVEN

Question. To immunize our service members as well as the general population, we need to produce enough vaccines. This includes having enough domestic manufacturing capacity to effectively produce the key components of the vaccines. As you may be aware, Aldevron is a company based out of Fargo, North Dakota, that manufactures advanced biological materials such as those used in the COVID-19 vaccines. They have a history of working with Federal partners, and are uniquely fitted to meet our future vaccine materials needs. Aldevron has been in communication with the Defense Production Title III Office at the Department of Defense as well as with the Biomedical Advanced Research and Development Authority (BARDA) to discuss their manufacturing capabilities.

Will you work with my staff to ensure that American manufacturing companies like Aldevron, which supply key starting materials for the production of medical countermeasures and vaccines, can be part of the solution as we continue to respond to COVID-19 and prepare for future pandemics?

Answer. OASD(HA) is happy to work with your staff to look at ways to improve the readiness of our Forces, including scale up and access to pandemic vaccines. We also have a robust relationship with Health and Human Services including BARDA, and are happy to explore partnerships that enable the Department to increase the protection of our force where it is most needed.

Question. I note from your testimony the work that you are doing with the Veterans Administration to develop a single separation health assessment for those leaving service. You mentioned that this would include a mental health assessment, which is an important component. In the past, we have taken steps to support our active duty force but left out our service members in the reserve components.

Can you confirm whether this assessment would be available to members of the reserve component who are separating from service?

Answer. Currently this assessment would be available to members of the Reserve Component (RC) who are separating from Service if they meet the eligibility requirements as specified in Section 1145(d) Physical Examinations for Certain Members of a Reserve Component, of Title 10.

Question. Would you support providing a single separation health assessment, including a mental health assessment, to all members of the Selected Reserve, regardless of whether or not they have served 30 days in support of a contingency operation?

Answer. We support evidence-based screenings and examinations based on known and potential risks experienced during military service and the individual's medical needs. The single separation health assessment under development includes a physical examination. For many short non-contingency operations a DD2697, "Report of Medical Assessment" or post-deployment health assessment and mental health assessment would be more appropriate and efficient for the Service member and DoD.

QUESTIONS SUBMITTED TO LIEUTENANT GENERAL R. SCOTT DINGLE

QUESTIONS SUBMITTED BY SENATOR RICHARD J. DURBIN

Question. What are you doing on a regular basis to drive an anti-tobacco message throughout your Service? Are we making progress?

Answer. The Army Surgeon General's role in promoting tobacco-free living and directing tobacco-free campuses creates momentum to transform Army culture. By providing a healthier, tobacco product-free environment and readily accessible serv-

ices to help users quit, the Army will cultivate a resilient, effective, and battle-ready force.

Revisions to Army policy, such as AR600–63, AR40–5, AR 600–85, to name a few, highlight and emphasize the responsibility of installations, commanders and supervisors to create a culture that encourages and reinforces tobacco-free living.

Tobacco use has decreased by nearly 7.0 percent since 2013. As of 2017 Army has a lower rates than the general population.

Question. What is the impact that we are seeing on service members with the rise of tobacco alternatives such as e-cigarettes and vapes?

Answer. Tobacco product use, including e-cigarettes and vapes are a threat to the readiness and the resilience of our Army. 7.2 percent of Soldiers now self-report use of E-cigarettes or vape pens. Soldiers who use e-cigarettes realize decreased performance during physical evaluation tests compared to those who do not use. Soldiers that smoke and vape do the poorest.

Some Soldiers view e-cigarettes and vapes as a safer alternative to cigarettes. Army Public Health is actively engaged with the DoD tobacco education campaign, and is continuing to educate Soldiers on the negative effects of e-cigarettes and resources to quit.

Question. What are you doing about the impact of tobacco on military children and family members? Are you reviewing whether these products should be sold in military exchanges or commissaries?

Answer. My team is working with Army Installation Management Command, in support of a great effort called Healthy Army Communities. Healthy Army Communities is an effort to create an environment where the healthy choice is the easy choice. The tobacco free-living part of this initiative is to work with installation commanders to expand tobacco free zones to where children live and play on installations, which is aimed at raising our Army youth as non-tobacco users.

Cigarettes used to be cheaper to buy on post than off post. One important effort with the reduction of tobacco use in our military was the DoD Tobacco Pricing Policy. Now, tobacco products sold on post must be the same price as off post. This is a big change for our Soldiers and literature demonstrates that price increase discourages tobacco use and increases quit rates.

QUESTIONS SUBMITTED BY SENATOR SUSAN M. COLLINS

Question. At the beginning of the COVID–19 pandemic, the nation saw a huge spike in demand for modular negative pressure room containment systems that can offer civilian hospitals or Military Treatment Facilities the capability to safely assess and treat patients with suspected COVID–19 symptoms.

It is clear these commercial-off-the-shelf systems can help ensure the readiness of the defense health system worldwide, especially in the case of future pandemics or biological attacks.

Section 732 of the recently enacted fiscal year 2021 National Defense Authorization Act (NDAA) requires a report of the Department's pandemic preparedness. I was pleased that the Department has committed to ensuring that these modular negative air pressure room containment systems are included as part of that Pandemic Preparedness Report directed by the NDAA. Provisions unanimously approved in the Senate's fiscal year 2021 NDAA bill also required a specific review of these systems.

Given the use of these systems in the civilian sector and in VA hospitals, what does the Army believe to be the potential benefits of these systems?

Answer. In accordance with NDAA 2017 and 2019, the Defense Health Agency assumed authority, direction, and control of DoD's CONUS medical treatment facilities (MTF) on 25 OCT 19 with the transfer of all MTFs and Service direct support to be complete by 30 SEP 21.

The Defense Health Agency implemented 14 modular COVID–19 screening facilities in CONUS and another eight OCONUS. The eight units in Europe include negative pressure rooms and HEPA filtration. The units in the U.S. do not include negative pressure rooms.

These modular facilities are used to screen patients before they enter the medical treatment facility. Modular, negative pressure room containment systems were not used for the treatment of Army COVID–19 positive patients.

Hospitals used existing patient isolation capabilities and modified rooms and HVAC systems to create isolation within their existing footprints. Portable, self-contained HEPA filtration systems were employed in some cases to create negative pressure in treatment spaces.

For dental clinics, DHA created Expeditionary Dental Air Infectious Isolation Rooms (EDAIIR) for two dental chairs per clinic using commercial-off-the-shelf HEPA whisper flow fan units and zip wall barrier sheathing.

Question. How could these types of systems be used by Army in the future to help mitigate the spread of future pandemics or biological agents in the future?

Answer. From Army perspective, Military Health System can implement a range of methods to help mitigate the spread of infectious diseases within MTFs.

Patient isolation, personal protective equipment, frequent cleaning, and personal hygiene all play a part.

Modular systems are one method for temporarily creating anterooms, treatment spaces, and support spaces. These systems can be used to physically separate visitors from patients and staff, contagious patients from non-contagious patients, and pre-admit patients from the admitted patient population.

Future implementation would be in DHA's decision space.

QUESTIONS SUBMITTED BY SENATOR LISA MURKOWSKI

Question. Over the past year, the world has grappled with COVID, and mental health continues to be one of the least understood and most overlooked effects of the pandemic. Stress, fear, isolation, financial impacts and the loss of friends and family have contributed to the increase in anxiety and depressive disorder symptoms.

Has the Department of Defense seen an increase in service member suicides over the past year?

Answer. Army Medical Command vigorously supports Army G-1 efforts to assess the root cause of the Army suicide cluster.

The Army is experiencing an increase of suicides coinciding with the COVID-19 pandemic.

Preliminary analysis by Army Public Health Center indicates the suicide cluster among Regular Army is correlated with COVID's timeline, however causality is not currently known.

Army Medicine provides Army Senior Leaders methods to mitigate clinical suicide risk through critical engagements with their troops and ensures critical information is provided to Commanders to support those with identified risk of suicide.

Question. Have you seen an increase in the utilization of mental health and suicide prevention services that the Department offers?

Answer. Early in the pandemic, BH service engagement by Army beneficiaries decreased.

Army Medicine's adaption to pandemic healthcare environment beneficiaries re-engaged in virtual behavioral services with a peak utilization of 70 percent of services being conducted virtual environment in April of 2020.

Social distancing policies are carefully lifted, the mix of in-person and virtual appointments are exceeding pre-pandemic levels and roughly 10 percent more unique beneficiaries are engaging in behavioral health services when compared to this time in 2019.

In March 2021, greater than 38K beneficiaries sought behavioral health services, which represents 33 percent increase from the same time in 2019.

Innovations in the virtual space developed from necessity are affording Army Medicine increased flexibility to provide services to patients in their home.

Army Medicine, in partnership with DHA, will continue to aggressively pursue and capitalize upon advancements in virtual behavioral health services as an enduring positive outcome of the global pandemic.

QUESTIONS SUBMITTED TO REAR ADMIRAL BRUCE L. GILLINGHAM

QUESTIONS SUBMITTED BY SENATOR RICHARD J. DURBIN

Question. I remain a very concerned about curbing the use of tobacco in the military. We know that smoking makes it harder for individuals to perform the tasks we ask of them, lengthens medical recovery, and increases illness, increases healing times and accounts for greater health costs. In fact, the DoD indicates that tobacco use costs the department at least \$1.6 billion annually. And it continues to trouble me that—amid all of the rigorous physical challenges and testing they perform—so many of our service-members pick up these habits after enlisting. We also know that there are continued concerns about military members using tobacco alternatives such as e-cigarettes and vapes. In addition, I was supportive of Congressional efforts to raise the Federal minimum age of sale of tobacco products from 18

to 21. But I remain concerned that we are not adequately addressing the youth vaping epidemic

What are you doing on a regular basis to drive an anti-tobacco message throughout your Service? Are we making progress?

Answer. I share your concerns about tobacco use in the military. Navy Medicine is strongly committed to ensuring Sailors and Marines are healthy, resilient, and physically and mentally fit to perform their demanding duties. Tobacco use impairs readiness, performance and fitness. As the Navy Surgeon General, I continue to promote tobacco free living. Given the stress brought about by the COVID-19 pandemic, we have released messages highlighting the negative effects of tobacco use and encouraging those who use tobacco to quit. We want our personnel to know that Navy Medicine can and will assist them in these efforts.

Our medical campuses are tobacco free compounds which reinforces our messages of healthy living and tobacco free living. During our medical and dental care, healthcare teams address tobacco use and provide evidence based treatment for nicotine dependence. Navy provides awareness and training on the dangers and harmful effects of tobacco and also provides education during the command orientation and indoctrination process. During recruit training and other schools, students are tobacco free. We use social media messages, developed by the Navy, Department of Defense (DoD) and Centers for Disease Control and Prevention (CDC), to promote tobacco free living along with extensive online resources to support our personnel and providers. We have also worked closely with the other Services and the CDC's Office of Smoking and Health to develop a 2020 media tobacco toolkit "Tips From Former Smokers® Military Service Members & Veterans Media Outreach Kit" for use and to partner with local and state organizations to promote tobacco free military communities.

We are making progress with reducing tobacco use in the Navy and Marine Corps. The encouraging news is that our tobacco use rates have declined over the past decade. Data from the Navy and Marine Corps Public Health Center's Health Risk Assessment show a reduction with smoking cigarettes and the use of smokeless tobacco in the Navy and Marine Corps within the past 2 years. These current trends are positive. We also anticipate that the Tobacco 21 law will contribute to a decline in tobacco use rates. It should be noted, however, vaping in the Marine Corps increased during this time period similar to the national trends of e-cigarette use.

Question. What is the impact that we are seeing on soldiers with the rise of tobacco alternatives such as e-cigarettes and vapes?

Answer. We are concerned about the use of e-cigarettes, vaping and other new and alternative tobacco products in the Navy and Marine Corps. Over the past few years, there has been increased use of e-cigarette use and vaping in this country among youth and adults. We know that they are addicting, harmful and not a proven smoking cessation strategy. E-cigarettes also contain cancer causing chemicals and cause lung and cardiovascular disease. At this time we don't know the full extent of and all the negative long term effects of vaping which is being studied and researched.

E-cigarette use is not safe. The use of these products have caused fires, explosions and injuries to our sailors and marines. As a result, Navy Fleet Forces Command and Pacific Fleet have suspended the use, storage and charging of any electronic nicotine delivery system device aboard all ships, submarines, aircraft, boats, crafts, vehicles and heavy equipment to ensure the safety of our forces. The new Secretary of the Navy instruction (SECNAVINST 5100.13F Navy and Marine Corps Tobacco Policy—2 December 2020) also bans e-cigarette, vaping and other alternative tobacco product use within military workspaces and facilities. We believe this approach helps protect the health and safety of our Naval Forces.

Question. What are you doing about the impact of tobacco on military children and family members? Are you reviewing whether these products should be sold in military exchanges or commissaries?

Answer. We want our military children, teenagers and families to be healthy and tobacco free. We address tobacco use during wellness and medical visits for children, adolescents and family members. Navy Medicine and the Defense Health Agency use the U.S. Public Health Service Treating Tobacco Use and Dependence Clinical Practice Guidelines to screen for and address tobacco use, encourage tobacco free living and provide resources, support and counseling. We encourage parents to quit using and not to use tobacco in their homes and around their children and families. Our medical team offers no cost, evidence-based tobacco cessation treatment for all beneficiaries. The Secretary of the Navy instruction protects children and families by banning tobacco use where children live, play and learn—at playgrounds and athletic fields, pools and schools.

Navy Medicine bans tobacco use on all medical property. Tobacco products are prohibited for sale in any exchanges and stores that are within hospitals, clinics or any other medical facilities. Sale of tobacco products at other exchanges are under the purview of the Navy Exchange and Marine Corps Exchange.

QUESTIONS SUBMITTED BY SENATOR SUSAN M. COLLINS

Question. At the beginning of the COVID-19 pandemic last year, the nation saw a huge spike in demand for modular negative pressure room containment systems that can offer civilian hospitals or Military Treatment Facilities the capability to safely assess and treat patients with suspected COVID-19 symptoms. It is clear these commercial-off-the-shelf systems can help ensure the readiness of the defense health system worldwide, especially in the case of future pandemics or biological attacks. Section 732 of the recently enacted fiscal year 2021 National Defense Authorization Act (NDAA) requires a report of the Department's pandemic preparedness. I was pleased that the Department has committed to ensuring that these modular negative air pressure room containment systems are included as part of that Pandemic Preparedness Report directed by the NDAA. Provisions unanimously approved in the Senate's fiscal year 2021 NDAA bill also required a specific review of these systems.

Given the use of these systems in the civilian sector and in VA hospitals, what does the Navy believe to be the potential benefits of these systems? How could these types of systems be used by Navy in the future to help mitigate the spread of future pandemics or biological agents in the future?

Answer. Senator Collins, thank you for your question. As reflected in my written testimony, Navy Medicine continues to work collaboratively with the DoD COVID-19 Task Force, the Joint Staff, the Defense Logistics Agency, the Defense Health Agency, the other Services, Uniformed Services University of the Health Sciences, interagency partners, and many others on the pandemic response.

There has always been a need for negative pressure capabilities in our medical treatment facilities to meet the needs of our patients and staff. Negative pressure systems, whether built-in or modular, can assist patients and protect healthcare staff from certain diseases and agents.

Navy Medicine has addressed these requirements on a permanent and temporary basis to meet the ongoing demands of the pandemic. In addition, both of Navy's hospital ships, USNS COMFORT and USNS MERCY, have negative pressure capabilities.

As directed by the fiscal year 2017 National Defense Authorization Act, the Defense Health Agency (DHA) has assumed authority, direction and control of military medical treatment facilities. In this role, the DHA has primary responsibility for medical systems and their clinical application in these facilities. Given these responsibilities, the integration and value of portable negative pressure capabilities is most appropriately addressed by the DHA to ensure a coordinated and comprehensive response within the Military Health System.

QUESTIONS SUBMITTED TO LIEUTENANT GENERAL DOROTHY A. HOGG

QUESTIONS SUBMITTED BY SENATOR RICHARD J. DURBIN

Question. I remain very concerned about curbing the use of tobacco in the military. We know that smoking makes it harder for individuals to perform the tasks we ask of them, lengthens medical recovery, and increases illness, increases healing times and accounts for greater health costs. In fact, DoD indicates that tobacco use costs the department at least \$1.6 billion annually. And it continues to trouble me that—amid all of the rigorous physical challenges and testing they perform—so many of our service-members pick up these habits after enlisting. We also know that there are continued concerns about military members using tobacco alternatives such as e-cigarettes and vapes. In addition, I was supportive of Congressional efforts to raise the Federal minimum age of sale of tobacco products from 18 to 21. But I remain concerned that we are not adequately addressing the youth vaping epidemic.

What are you doing on a regular basis to drive an anti-tobacco message throughout your Service? Are we making progress?

Answer. The Department of the Air Force continues to discourage the use of all tobacco products. The DAF military treatment facilities support enrolled beneficiaries who require tobacco cessation support, which included access to medications, in-person counseling, and quit line counseling.

Yes, we are making progress. Since early 2020, Active Duty cigarette and smokeless tobacco use continues to decline, and E-cigarette use rates have remained steady.

Question. What is the impact that we are seeing on service members with the rise of tobacco alternatives such as e-cigarettes and vapes?

Answer. We have not seen a significant negative impact in reported cases of pulmonary distress due to use of tobacco alternatives. Retrospective study analysis illustrate individuals using vaping oils have the highest likelihood of experiencing pulmonary distress, particular because vaping oils are not regulated. Active military members who use tobacco and its alternatives are provided educational information about the dangers and available resources if they wish to quit.

Reference: Rice SJ, Hyland V, Behera M, Ramalingam SS, Bunn P, Belani CP. Guidance on the Clinical Management of Electronic Cigarette or Vaping-Associated Lung Injury. *J Thorac Oncol.* 2020 Nov;15(11):1727–1737. PMID: 32866653.

Question. What are you doing about the impact of tobacco on military children and family members? Are you reviewing whether these products should be sold in military exchanges or commissaries?

Answer. The sales of tobacco products is prohibited in all Air Force Services Activity (AFSVA) facilities (e.g., Clubs, Force Support Morale, Welfare, and Recreation facilities, golf course). Note: The military exchange and commissary are not AFSVA facilities and therefore cannot provide further comment about their anti-tobacco policies or initiatives.

QUESTIONS SUBMITTED BY SENATOR SUSAN M. COLLINS

Question. At the beginning of the COVID–19 pandemic last year, the nation saw a huge spike in demand for modular negative pressure room containment systems that can offer civilian hospitals or Military Treatment Facilities the capability to safely assess and treat patients with suspected COVID–19 symptoms. It is clear these commercial-off-the-shelf systems can help ensure the readiness of the defense health system worldwide, especially in the case of future pandemics or biological attacks. Section 732 of the recently enacted fiscal year 2021 National Defense Authorization Act (NDAA) requires a report of the Department's pandemic preparedness. I was pleased that the Department has committed to ensuring that these modular negative air pressure room containment systems are included as part of that Pandemic Preparedness Report directed by the NDAA. Provisions unanimously approved in the Senate's fiscal year 2021 NDAA bill also required a specific review of these systems.

Given the use of these systems in the civilian sector and in VA hospitals, what does the Air Force believe to be the potential benefits of these systems?

Answer. The primary benefit is the minimal assembly time required and subsequently, limiting the disruption of operations in the military treatment facilities (e.g., fixed facility operations).

Question. How could these types of systems be used by Air Force in the future to help mitigate the spread of future pandemics or biological agents in the future?

Answer. Modular containment systems can be used in the future to help mitigate the spread of future pandemics or biological agents by:

- Providing a temporary, alternative solution when a permanent facility is at risk of operating beyond its surge capacity
- Mitigating the difficulties in establishing facilities in austere environments

QUESTIONS SUBMITTED BY SENATOR LISA MURKOWSKI

Question. I appreciate Lt Gen Hogg's recognition of the ever growing importance of the Arctic. I would like to hear more about the Below Zero Medicine Program.

What challenges does extreme cold place on medical service?

Answer. The major challenges include, but not limited to, a lack of reliable extreme cold weather functioning medical and non-medical equipment, no suitable expeditionary medical facility, and the need to develop standard operating procedures/clinical practice guidelines.

Question. What has the outcome been from the Below Zero Medicine summits?

Answer. First, we developed the Cold Region Expeditionary Medical Operations concept. Second, we increased collaboration in extreme cold weather medicine research and facilitated joint service exercise participation. Finally, we are pursuing the development of recurring medical educational materials and a training curriculum proposal for military personnel.

Question. Will the fiscal year 2022 request contain any Arctic-centric medical requests?

Answer. There are no budget requests planned for fiscal year 2022.

Question. In October of 2018, administration and management of the Military Treatment Facilities (MTFs) began to transfer from each Military Department to the Defense Health Agency (DHA). This transition also came with significant cuts to active duty medical personnel, the fiscal year 2021 plan reduces the medical force by 9.6 percent (7,422 personnel). Additionally, the transition includes restructuring the mission and scope of each MTF which must be completed by the end of fiscal year 2021.

Given these significant changes and cuts to medical personnel, have medical readiness rates increased for our total force?

Answer. No, the Military Health System changes have not significantly affected the medical readiness rates over the last 2 years.

Question. If so, have the standards for tracking medical readiness also changed?

Answer. The standards for tracking medical readiness have not changed.

Question. It was mentioned that COVID-19 has affected medical readiness within the military.

Specifically Dental Readiness, how far behind has the DoD fallen with regard to providing dental care to service members and what is your plan to eliminate this backlog?

Answer. AF/SG has worked closely with the military treatment facilities to develop a leveling strategy to expand scope and capacity of dental care and to target any backlog of pending dental readiness examinations. Pre-pandemic dental readiness in February 2020 was 93.8 percent. Currently, dental readiness is 92.7 percent and continues to increase as we move past the pandemic. Overall, meeting dental readiness requirements has not slowed down the ability to support the warfighting mission.

QUESTIONS SUBMITTED BY SENATOR JOHN HOEVEN

Question. In your testimony, you mention the ongoing rollout of a new initiative that embeds Operational Support Teams (OSTs) at Air Force installations around the country. Minot Air Force Base was one of four locations to participate in the Task Force True North beta test, where the OST initiative began. In 2020, RAND Corporation evaluated the beta test and its initiatives. Four of five initiatives, including OSTs, were well received by leadership, providers, and airmen and the data supports a broad expansion of those initiatives across the Air Force. I want to express my support for new programs like Task Force True North and its initiatives that can improve the resilience and well-being of our airmen and their families.

What were the key takeaways from the Task Force True North beta test?

Answer. The key takeaways are:

- Embedded medical programs are very popular with Airmen and Guardians. In particular, they like the accessibility, and ability to build a relationship with the assigned medic.
- Embedded medical programs increase help-seeking, not only for their services but for the military treatment facilities as well (i.e. Mental Health Clinic increased 25 percent)
- Training civilian embedded professionals takes significant time, to ensure their cultural competence and ability to synchronize with the military treatment facility.

Question. How do you see these types of initiatives being rolled out across the entire Air Force?

Answer. Embedded initiatives should be rolled out based on risk and need because of the practical limitations of how many providers/specialists the Department of the Air Force can retain or recruit (i.e., impossible to embed personnel in every unit).

Additionally, supporting these types of initiatives requires balancing the access demands placed on our military treatment facilities demands.

SUBCOMMITTEE RECESS

Senator TESTER. The Defense Subcommittee will reconvene on Tuesday, April 27, at 10:00 a.m. for a closed hearing on the Missile Defense Agency.

This committee stands in recess.

[Whereupon, at 10:13 a.m., Tuesday, April 20, the subcommittee was recessed, to reconvene at 10:00 a.m., Tuesday, April 27.]

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 2022

TUESDAY, MAY 18, 2021

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC..

The committee met at 10 a.m. in room SH-216, Hart Senate Office Building, Hon. Jon Tester, (chairman) presiding.

Present: Senators Tester, Durbin, Feinstein, Schatz, Baldwin, Shaheen, Shelby, Collins, Murkowski, Moran, Hoeven, and Boozman.

DEPARTMENT OF DEFENSE

NATIONAL GUARD RESERVE

OPENING STATEMENT OF SENATOR JON TESTER

Senator TESTER. I want to call this committee hearing to order.

I want to thank our witnesses today. We have General David Bellon of the Marine Corps Reserve. We have Lieutenant General Jody Daniels of the Army Reserve. We have General Daniel Hokanson of the National Guard Bureau. We have Admiral Mustin of the Navy Reserve, and we have Lieutenant General Scobee, Chief of the Air Force Reserve.

Thank you all for being here and we look forward to your testimony.

Before I get started on my prepared statement, I want to say when you guys are up to bat, there are five of you, try to hold it to 5 minutes. Your entire written statement will be a part of the record.

I would just say this. Americans owe the National Guard and Reserve a debt of gratitude for your response to the COVID-19 pandemic. Nearly 60,000 National Guard and Reserve service members answered the call of duty. These were historic record-breaking mobilizations, and I want to personally say thank you to you and the dedicated men and women under your command as well as their families.

The pandemic has impacted all Americans. We all know how it has disrupted our families and our careers with so many jobs lost and questions about how to pay the bills.

Nearly 800,000 members of the Guard and Reserve have been through the same, plus deployments, both domestically and abroad. That places further strain on families and civilian employment.

Senators are reminded of these sacrifices every day when we come to work because one of those deployments is right here in our Nation's Capital.

This subcommittee wants to make sure that we're doing right by all Americans that serve in uniform. That means supporting them with pay and benefits that they have earned, making sure they are properly trained for their missions, providing for their mental and physical health, and ensuring that they have the equipment that they need when they're mobilized.

When the President's 2022 budget arrives in the coming weeks, one of my first questions will be what it means for the well-being of our Reserve components on all those fronts and more.

I look forward to continuing our engagement with each one of the witnesses here today after the budget is provided to Congress. We want to know how that budget will support your priorities for the coming year, but as for today, I look forward to your testimony on the state of each of the Reserve components, what challenges you are facing, and how this subcommittee can help.

With that, I'll turn it to Senator Shelby.

STATEMENT OF SENATOR RICHARD C. SHELBY

Senator SHELBY. Thank you, Mr. Chairman.

I want to welcome all of our witnesses today. Our National Guard and Reserve perform a vast and critical role in our national defense. They're called to respond to national disasters, homeland security threats, and overseas contingencies are constant.

Their unwavering commitment has been particularly evident over the last year as thousands have been deployed at unprecedented rates to provide medical care and administer vaccines during the COVID-19 pandemic.

On behalf of my colleagues, I want to thank all of you, the men and women who carry these tasks out.

I want to also at this point as near-peer competitors, as we realize, are modernizing and developing their military capabilities at alarming rates, we want to ensure your departments receive the necessary resources to remain a ready and lethal force.

I recognize that we will not receive the budget until May 27. As a result, our conversations about specific funding items may be limited, but I also look forward to hearing from each of you about the ongoing efforts to sufficiently recruit, to train, and equip our Reserve forces, especially in light of setbacks due to the pandemic.

Mr. Chairman, I thank you for calling this hearing today.

Senator TESTER. Thank you, Senator Shelby.

And we will start with Lieutenant General David G. Bellon, Commander of the U.S. Marine Corps Reserve.

STATEMENT OF LIEUTENANT GENERAL DAVID G. BELLON, COMMANDER, U.S. MARINE CORPS RESERVE

General BELLON. Chairman Tester, Ranking Member Shelby, and Distinguished Members of the Subcommittee, thank you for the opportunity to appear before you today and testify on behalf of the Commandant of the Marine Corps about your Marine Corps Reserve.

I'm honored to appear with my fellow Reserve component service chiefs and my senior enlisted advisors, Four Star Major Carlos Ruiz, who sits behind me, and Force Command Master Chief Cary Wesser.

The mission of the Marine Corps Reserve is to augment, reinforce, and sustain the Active component. We have Reserve forces forward deployed alongside and integrated with our Active counterparts, supporting numerous combatant commander requirements on a daily basis.

Over the past year, more than a thousand Reserve Marines and sailors activated and deployed to support 20 operational requirements across six geographic combatant commands.

Despite the ongoing global pandemic, the Marine Corps Reserve has continued to train, equip, and prepare for the next fight.

I want to thank each of the members for your support to the Marine Corps' Force Design Initiative over the past year. While this has necessitated the closure of our Reserve Tank Units and Bridging Companies, we could not have begun our transition to a more nimble and lethal force without your assistance.

I want to thank my fellow service chiefs, particularly the National Guard, for their support. They have been true partners by providing great options to our Reserve Marines who elected to transition to the National Guard in lieu of continuing their service as a Marine outside the immediate region.

I would also like to acknowledge Admiral Mustin and the Navy Reserve for committing to explore new ways to integrate our Navy and Marine Corps Reserve Team to ensure we are best postured for the future fight.

Despite the tremendous pressures and obstacles that COVID-19 has presented, I'm pleased to inform you that the morale in your Marine Corps Reserve remains high as evidenced by the Reserve component end strength of 99 percent of our total requirement.

Not only are we attracting new Marines but they are also committing to service beyond their contractual obligations. On any drill weekend, an average of 25 percent of the Marines standing in formation are not contractually obligated to be there.

Every month these Marines have a decision to make and they choose to continue to serve and lead their fellow Marines and sailors. I'm always impressed by the professionalism, competence, dedication to duty, and motivation of our Reserve Marines. The way they balance family responsibilities, civilian careers, and school with their military service is nothing short of extraordinary.

Like their Active Duty brothers and sisters, they serve selflessly to protect our great Nation and they continue to answer their irrational call to serve.

As Secretary Austin highlighted, our most critical asset is our people. The Marine Corps Reserve must promote and retain the very best Marines and sailors, regardless of race, gender, ethnicity, or background.

Through the diversity of thought and action, we can find more resourceful and innovative solutions to the increasingly complex problems presented from great power competition.

We are actively developing new initiatives and strategies to help achieve a more diverse and ultimately a more talented Marine

Corps Reserve. We will need all Marines and sailors to contribute to solving the issues we will face and to ultimately win the next fight.

I want to thank this subcommittee for your continued support to the National Guard and Reserve equipment appropriation.

As you may recall, last year I requested your support for my effort to use NGREA (National Guard and Reserve Equipment Appropriation) funds to remedy the deficiencies of individual combat clothing and equipment within the Marine Corps Reserve. As ICCE (Iceland Command Control Enhancement) becomes more expensive in the future, a more flexible NGREA is a key tool Congress can employ to help protect our warfighters.

In closing, I want to extend my gratitude for your ongoing efforts to provide timely appropriations each year. This has a direct impact on your Reserve Marines and sailors and their limited number of training days.

Your continued support will help to ensure the Marine Corps Reserve will have predictable and uninterrupted training schedules to maximize personnel, material, and training readiness.

I appreciate the opportunity to be here today and I look forward to your questions.

[The statement follows:]

PREPARED STATEMENT OF LIEUTENANT GENERAL DAVID G. BELLON

Chairman Tester, Vice Chairman Shelby, and distinguished members of the Subcommittee, it is my privilege to appear before you and provide an overview on the current state of the Marine Corps Reserve.

The Marine Corps Reserve, as part of the Total Force Marine Corps, stands ready to provide forces for employment across the full spectrum of crisis and global engagement. This past year has brought many challenges with the global pandemic but your Marine Corps Reserve continues to be engaged around the world in theater security cooperation activities, serving side-by-side with our Active Component on a wide array of operations, and making tremendous contributions in support of every Combatant Commander. While the Marine Corps Reserve is supporting current Service and Combatant Command requirements, we are also participating in the Service's efforts to redesign our force and our warfighting capabilities to deter against pacing threats as prescribed by the National Defense Strategy.

I am deeply impressed by the professionalism, competence, and dedication of our Reserve Marines and Sailors. Like their Active Component counterparts, they serve selflessly to protect our great nation. I am inspired by the way they balance family responsibilities, civilian careers, and military service. They do so with humility, without fanfare, and with a sense of pride and dedication that is consistent with the great sacrifices of Marines from every generation. Without a doubt, the success of the Marine Corps hinges on the dedication and selflessness of our Reserve Marines.

A TOTAL FORCE

Throughout the past year, the Marine Corps Reserve continued global deployments in support of Combatant Commander requirements despite the unprecedented challenges presented by COVID-19. The Marine Corps Reserve provided Combatant Commanders with forces focused on combat operations, crisis prevention, crisis response, and theater security cooperation. In addition to the Marines already activated and deployed, 2020 saw another 1,044 Reserve Marines mobilized to support 20 operational requirements across six geographic Combatant Commands. The Marine Corps Reserve continues to meet the increased demand for use as an Operational Reserve; however, this remains a challenge to our readiness and ability meet strategic requirements.

In 2021, the Marine Corps Reserve is slated to support the Combatant Commanders by mobilizing in excess of 966 Reservists supporting 28 formations. These operations greatly increase the Reserve Component's interoperability with the Active Component, Joint forces, our allies, and coalition partners. I anticipate that we

will continue to deploy across the globe and integrate with the Active Component in support of high-priority Combatant Commander requirements for the foreseeable future.

In addition to supporting Combatant Commanders, the Marine Corps Reserve provided direct support to the Marine Corps' accession requirements by responding to emerging COVID-19 requirements. The Marine Corps Reserve activated more than 500 Marines and Sailors to augment and reinforce the Marine Corps Recruit Depots at Parris Island and San Diego. These Marines ensured the recruits awaiting training maintained proper quarantine protocols, enabling assimilation into training platoons with minimal risk of a COVID-19 outbreak during training. As a result of this Total Force effort, the mission to make Marines continued despite the global pandemic.

The Marine Corps Reserve typically uses participation in the Department of Defense Innovative Readiness Training (IRT) program to provide joint/military training in the United States and its territories to increase deployment readiness. IRT simultaneously provides key services (health care, construction, transportation, and cybersecurity) with lasting benefits for our American communities. We saw a significant reduction in IRT programs due to the global pandemic. The Marine Corps Reserve participated in only two projects in 2020 but obtained valuable training that increased deployment readiness in combat engineering skills. Our participating units were able to train to mission essential tasks involving both horizontal and vertical construction, while making tangible, meaningful impacts in their communities. We expect a marked increase in future projects. In 2021, the Marine Corps Reserve is slated to support 16 exercises under the IRT program. Examples include diverse construction training supporting the Girl Scouts at Camp Paumalu, Hawaii; providing logistical support and medical care to communities throughout Kodiak Island, Alaska; and roadwork in Pima County, Arizona. With your continued support of these efforts, we look to expand our footprint in this program, which will include construction, medical, and cybersecurity efforts.

In addition to participating in operational requirements across the globe, the Marine Corps Reserve supports the Total Force by dutifully executing the sensitive and crucial mission of providing casualty assistance to the families of our fallen Marines. There is no responsibility we treat with higher regard than this solemn mission. Inspector-Instructor (I-I) and Reserve Site Support staffs are geographically positioned to accomplish the vast majority of Marine Corps casualty assistance calls and are trained to provide compassionate and thorough assistance to families. Indeed, the vast majority of Marine Corps casualty notifications and follow-on assistance calls to the next of kin are made by our Reserve Marines. During Calendar Year (CY) 2020 our I-I and Reserve Site Support staffs performed 95% of the casualty calls performed by the Marine Corps. The professionalism and compassion of our Casualty Assistance Calls Officers (CACOs) continues well beyond the initial notification. We ensure that our CACOs are well trained, equipped, and supported by all levels of command through a combination of in-person and online training. Once assigned, the CACO serves as the family's central point of contact and coordinates with funeral homes, government agencies, and other organizations. They assist family members with planning the return and final resting place of their Marine and ensure the filing of appropriate documents so families receive all benefits to which they are entitled. In many cases, our CACOs provide a long-lasting bridge between the Marine Corps and the grieving family.

The Marine Corps Reserve also performs the solemn mission of military funeral honors and our Reserve units take pride in performing the majority of these services for our fallen Marines and their families. Marine Corps funeral honors are dedicated to ensuring all Marines who have served obtain the appropriate honors as a final salute to their life and the final demonstration of the country's gratitude to those who, in times of war and peace, have faithfully defended our nation. COVID-19 presented many new challenges for units performing military funeral honors such as: the temporary closing of our cemeteries; mandatory compliance with local city, state and federal government travel restrictions; and strict adherence to health and safety guidelines. Notwithstanding these challenges, Marine Corps Reserve units accomplished 16,521 military funeral honors, nearly 81% of the previous year's total.

Finally, the Marine Corps Reserve functions as the greatest link between the Marine Corps and communities across the nation. From the Toys for Tots campaigns each holiday season to community engagement events and solemn funeral details, we are the face of the Marine Corps to the majority of the American public. With Reserve units located across the country, the Marine Corps Reserve is uniquely positioned to interact with the American public and communicate the Marine Corps story to our fellow citizens, most of whom have little or no experience with the Marine Corps.

PERSONNEL

Marines, Sailors, and our civilian Marines are the foundation of all that we do. The resources we dedicate to sustaining and developing this foundation directly contribute to the success of our institution. The vast majority of the Marine Corps Selected Reserve's authorized end strength of 38,600 falls under Marine Forces Reserve. The Selected Reserve is composed of Marines in four categories: Selected Marine Corps Reserve (SMCR) Units, Active Reserve (AR), Individual Mobilization Augmentees (IMAs), and service members in initial training (IADTs). Embedded with these Marines are 1,557 Active and Reserve Component Sailors who serve critical roles in the operational, medical, dental, and spiritual readiness of our Reserve force. The success of the Marine Corps Reserve would not be possible without the support of these Sailors and US Navy programs.

In addition to the Marines and Sailors of the Selected Reserve, the Marine Corps Reserve administratively controls approximately 62,000 Marines who serve in the Individual Ready Reserve (IRR). The Marine Corps Reserve continues to monitor the mobilization viability of these IRR Marines through the use of muster events at multiple locations across the country. These muster events allow the Marine Corps Reserve to ensure the IRR Marines meet the requirements for mobilization. The events also provide the opportunity to address administrative issues, conduct mental health and post-deployment assessments, review Reserve obligations and new opportunities, and meet with Marine Corps prior-service recruiters. During the past year the Marine Corps Reserve conducted 20 muster events which 4,862 IRR Marines attended. In addition to the musters, the Marine Corps Reserve contacted and screened 59,294 Marines.

The Marine Corps Reserve strives to retain the very best Marines capable of fulfilling our leadership and operational needs. The option of continued service in the Reserve Component has become increasingly appealing to young Marines leaving active duty. Marines approaching the end of their current contracts, whether Active or Reserve Component, receive counseling on the tangible and intangible benefits of remaining affiliated with the Selected Reserve. We educate each transitioning Active Component Marine on opportunities for continued service in the Marine Corps Reserve through the Marine Corps' transition assistance and educational outreach programs.

Even as the Marine Corps restructures our forces to ensure we are postured to confront future potential adversaries, we are making every effort to retain those Marines impacted by force design decisions. In 2020 we deployed a series of Personnel Transition Teams (PTTs) to every unit impacted by force design. These PTTs were specifically designed to ensure every impacted Marine was provided information, education, and one-on-one career counseling concerning available incentives, career opportunities, and continued service options. For example, during the divestment of our reserve tank battalion we successfully retained over 52% of all Reserve Marines assigned to those site locations through voluntary reassignment to another Marine Reserve unit, while an additional 24% of those Marines chose to transfer to their local Army National Guard tank unit in order to continue their military service. Survey responses show that 91% of the Reserve Marines felt they had been provided both the information and support needed to make an informed decision, while 89% of the Reserve Marines felt that their best interests were kept in mind.

Recruiting and retaining high quality Marines remains essential to the Marine Corps' reputation as the nation's force-in-readiness. Although we produced Marines safely in the face of the global pandemic, the challenges associated with COVID-19 have had a significant impact on our ability to recruit. As a result, the Selected Marine Corps Reserve faced a 50.4% reduction in new non-prior service accessions and a loss of 7.9% of the forecasted prior-service accessions. Notwithstanding these notable losses, Marine Forces Reserve still enjoys high affiliation and retention rates enhanced through incentive programs such as occupational specialty retraining, inactive duty travel reimbursement, and bonus payments. These programs are essential to ensure we continue to meet authorized end strength and retain our most talented Marines. Your continued support to these critical programs has helped preserve our overall personnel end strength at 94.3% of the total requirement and maintain a grade and Military Occupational Specialty match rate of 81.7%.

Our personnel readiness is not only reflective of the health of the force, but directly contributes to our overall operational readiness. While we fully expect to meet our Selected Marine Corps Reserve retention and recruiting goals this year, continued use of available incentive programs is critical to optimally align our inventory against our requirements, maintain individual and unit level readiness, address shortfalls in staff non-commissioned officers, and fully rebuild readiness from previous force structure changes.

EQUIPMENT

Reserve Component units remain highly interoperable with their Active Component counterparts due to the Marine Corps' Total Force approach to equipment fielding and management. Reserve Component forces are manned, trained, and equipped to standards that facilitate the seamless, integrated employment of forces to meet Combatant Commander requirements. Our Reserve units and personnel continue to be in high demand despite the challenges associated with the new COVID-19 operating environment. The Reserve Component continues to meet all operational and training requirements, including support to Combatant Commanders worldwide.

This operational tempo places stress on our ability to maintain our equipment and replenish our deficiencies. In the event of a large-scale wartime mobilization, to include any sizable call-up of the IRR, individual combat clothing and equipment deficiencies may become a strategic risk to mission.

With regard to maintenance readiness, the Marine Corps Reserve has mitigated risk for many years in three ways. First, we refine units' Training Allowances (TA), which is that portion of a unit's full Table of Equipment (TE) located at Reserve Training Centers. Our goal is to balance the amount of equipment necessary to conduct training with the amount of equipment that can be maintained within personnel, facility, and fiscal constraints. Second, we leverage operation and maintenance, Marine Corps Reserve, funds to secure mobile maintenance support teams that augment our limited organic maintenance capacity in the Marine Corps Reserve. Third, we contract third party logistics to repair secondary reparable that cannot be repaired organically due to the lack of an intermediate maintenance activity capability. Congressional support for Reserve funding in the Fiscal Year (FY) 22 President's budget request is paramount to our continued success in sustaining our equipment and maintenance readiness.

Upcoming fielding of the Joint Light Tactical Vehicle (JLTV) and Amphibious Combat Vehicle (ACV) will provide the Reserve Component with the latest generation of combat equipment. Additionally, fielding of programs such as the Ground/Air Task Oriented Radar (G/ATOR), Ground Weapons Locating Radar (GWLR), All Terrain Crane (ATC), Platoon Water Purification System (PWPS), and Mobile Integrated Remains Collection System (MIRCS) will enhance our ability to fight, maneuver freely, and win on the modern battlefield. The KC-130J Super Hercules remains a procurement priority of the Marine Corps Reserve. The Marine Corps Reserve has currently reached Initial Operating Capability (IOC) for 13 of 28 aircraft and is expected to reach Full Operating Capability (FOC) in the future.

TRAINING

The Marine Corps Reserve typically participates in a number of training exercises in the United States and overseas each year to improve combat readiness and enhance our ability to rapidly activate and integrate with the Active Component. The global pandemic presented numerous challenges to the Reserve force's ability to participate in and conduct training. By April 2020, we had canceled drill weekends and annual training periods to protect the Marines, their families, and local communities. In order to limit the amount of lost training opportunities, we created telework drill weekends and increased occasions for Marines to conduct online training. Our local commanders demonstrated initiative and creativity in conducting meaningful training for the Marines. While digital training allowed for an increase in individual skills, it could not replace critical unit training at the company and battalion levels.

With several months of data available, we determined the risk of not providing ready forces as the result of conducting in-person training exceeded the risk from COVID-19. We therefore began to resume in-person drill weekends in June and enabled Marines to conduct their annual training in the 4th quarter of FY20. Operations in a COVID-19 environment became the norm, with precautions including the wearing of masks and social distancing during training. Local commanders adjusted their training to include spreading out unit drills over multiple weekends to ensure compliance with local health mandates for reduced gathering of personnel. Our small unit leaders performed admirably during this trying period, maintaining communication with their Marines and ensuring mitigation measures were enforced to guarantee quality training while preventing the spread of the pandemic as a result of in-person drills. At the end of FY20, we were able to provide an opportunity for all Reserve Marines to participate in an annual training period, whether in person or virtually.

The global pandemic adversely affected higher level training normally gained during regularly scheduled exercises. Combatant Commanders and host nations can-

celed joint and bi-lateral exercises due to COVID-19 restrictions; in FY20, 48 of 71 scheduled exercises across four Combatant Commands were canceled. Reserve participation in the exercises that did take place was largely eliminated due to Restriction-Of-Movement (ROM) requirements. These exercises were designed to provide mission essential task training in a joint environment. This left nearly 3,000 Marines in need of an alternate annual training period. Reserve participation in the annual Service-level Integrated Training Exercise (ITX) conducted aboard Marine Corps Air Ground Combat Center, Twentynine Palms California was also canceled due to the global pandemic. ITX improves combat readiness, efficiency in Total Force integration, and enables more rapid activation response times at the battalion and squadron levels. The loss of the Combatant Commander exercises, ITX, and numerous battalion and squadron annual training exercises in CY20 has resulted in a less operationally ready Marine Corps Reserve.

Operating in a COVID-19 environment directly impacted Reserve Marines' ability to complete required resident professional military education (PME) courses. The Marine Corps Reserve converted the majority of its 800 seats in resident PME to online courses to overcome the challenges of educating the force. Employing ROM, wearing of masks, and social distancing, the Marine Corps Reserve preserved nearly 300 resident seats, enabling Marines to attend PME in person with their fellow Marines.

The Marine Corps Reserve uses training simulators wherever and whenever possible to preserve fiscal and materiel resources. Reserve units employ Indoor Simulated Marksmanship Trainers (ISMTs) to maintain combat marksmanship skills and to maximize the use of their most precious resource: time. The ISMTs enable onsite training and eliminate long distance travel to remote Department of Defense (DoD) training locations. The use of ISMTs as well as increased online training enabled the force to complete mission essential tasks and required DoD and Service-level annual training during the global pandemic.

FACILITIES

The Marine Corps Reserve occupies facilities in 47 states, the District of Columbia, and the Commonwealth of Puerto Rico. These facilities include 158 Reserve Training Centers (RTCs) (22 of which are owned by Marine Forces Reserve and the remaining 136 of which are operated by other Services with Marine Corps Reserve units as tenants), three family housing sites, one permanent barracks, and one General Officer Quarters. Although some of these facilities are located on major DoD installations, most are situated within civilian communities, ranging from neighborhoods to industrial and commercial districts. We continue to improve the maintenance and security of our facilities to ensure the safety of our Marines and Sailors and to provide effective training and mobilization locations.

Fifty-seven percent of the facilities budget supports the day-to-day cost of operating and maintaining existing infrastructure. The Marine Corps Reserve has improved the overall readiness of our facilities inventory through the Facilities Sustainment, Restoration and Modernization (FSRM) support program and maximized the impact of our budget through divestiture and demolition of excess footprint.

The Marine Corps' Military Construction, Navy Reserve (MCNR) program focuses on providing construction for new and enduring capabilities, as well as recapitalization of our aging facilities. The construction provided by the annual authorization and appropriation of MCNR funding is an important factor in advancing our facilities support mission as we optimize our force laydown throughout the nation. Continued support for our MCNR request is essential as we divest of failing infrastructure and modernize capabilities.

The combined effects of our targeted consolidation, FSRM, and MCNR programs have steadily reduced the number of inadequate or substandard Reserve Training Centers and enabled better support to the force. In addition, our targeted consolidation, FSRM, and MCNR programs have increased the force protection of our Marines and Sailors. These programs have allowed the Marine Corps Reserve to partner with the joint bases and other services to meet the Department of Defense security and force protection lines of effort promulgated by the Secretary of Defense following the 2015 Chattanooga, Tennessee U.S. Navy Reserve Center shootings.

As our infrastructure ages and we continue to implement force protection improvements along with environmental and energy-saving projects, our operating costs have steadily increased. Service level efforts to modernize our force and its infrastructure have also increased costs. The continued support to our annual funding request for our facilities program will enable us to improve the overall physical infrastructure that reinforces the operational readiness of our units.

HEALTH SERVICES

The Marine Corps Reserve Health Services Support (HSS) system prioritizes the health and wellness of our Reserve Marines and Sailors. We continue to improve medical readiness through a robust Individual Medical Readiness program within the Marine Corps Reserve and by accurate monitoring, identification, and supervision of unit level actions necessary to attain readiness goals. Additionally, our Health Services personnel participate in Force Readiness Activation Assessment Program inspections and audits which provide oversight at the unit level and the ability to monitor readiness and adherence to policy.

The Reserve Health Readiness Program (RHRP) has greatly increased overall medical and dental readiness throughout the force. This program provides support using contracted civilian medical and dental providers to work with units that do not have organic medical or dental support personnel or are not supported by a Military Treatment Facility (MTF). During FY20, the RHRP performed 14,946 Periodic Health Assessments (PHAs), 216 Post-Deployment Health Re-Assessments (PDHRAs), 18,229 audiological examinations, and 16,787 dental examinations.

HSS's priority is to achieve the DoD's goal of a 90% medically ready force. National, regional, state and local restrictions on travel and group activities due to COVID-19 community transmission affected scheduling and availability of both organic unit and RHRP readiness events over the course of several months. During FY20, our individual medical and dental readiness rates were 76% and 81%, respectively. Marine Corps Reserve units rely heavily on RHRP to maintain our medical and dental readiness, and continued support of this program is imperative for maintaining overall readiness.

BEHAVIORAL HEALTH

In addition to the RHRP, the Marine Corps Reserve continues to execute a robust behavioral health program which includes Combat Operational Stress Control, Suicide Prevention, Substance Abuse Prevention, and Family Advocacy programs. Operational Stress Control and Readiness (OSCAR) training is conducted at all levels and continues to be provided during pre-deployment training to service members deploying for more than 90 days and all to commands in garrison. This training provides essential knowledge, skills, and tools to assist commanders in preventing, identifying, and managing combat and operational stress concerns as early as possible. Each of these tools supports the commander in building unit strength, resilience, and readiness as well as keeping Marines in the fight.

COVID-19 community transmission has not only impacted medical readiness, but also the mental health of our Marines and Sailors. Amongst our Active and Reserve Component service members mental health effects included increased isolation, relationship stress, and financial strain. The Navy Bureau of Medicine and Surgery continues to support behavioral health through various independent, contracted programs such as PDHRA and the Psychological Health Outreach Program (PHOP). The PDHRA program focuses specifically on identifying issues that emerge after our Marines and Sailors have returned home from deployment. PHOP secures behavioral health screenings, psychological treatment referrals, and essential follow-up treatment to ensure our service members' behavioral health needs are met. In FY20, PHOP received 584 new referrals through their outreach services. PHOP addresses both post-deployment behavioral health concerns and crisis-related interventions by providing our Marines and Sailors access to local resources through a network of contracted behavioral health programs. These programs are critical to maintaining a resilient force by providing pathways for Marines, Sailors, and families to seek behavioral health assistance.

Signs of operational and combat stress may manifest long after a service member returns home from deployment. This delayed onset of symptoms presents unique challenges to Reserve Marines who may be detached from vital medical care and the daily support network inherent in active duty Marine Corps units. Encouraging Marines to recognize and communicate mental health issues is a pervasive challenge facing our commanders. The Marine Corps Reserve addresses the stigma associated with mental health care through key programs such as the Yellow Ribbon Reintegration Program (YRRP) and OSCAR. Furthermore, we market all of our behavioral health initiatives and programs through our Marine Corps Reserve website and during key Marine Corps forums throughout the year.

In FY20, we developed and are now piloting a smart phone mobile application (app) that is tailored to Marine Reservists. USMC Connect is a Defense Information Systems Agency approved, enterprise-wide, mobile app that serves as a gateway to public content on government websites. The USMC Connect app was established to deliver portable, timely, and relevant information to Marines, Sailors and their fam-

ilities and to reduce reliance on traditional computers to access career and personal resources. The app is customizable, enabling units to provide Marine Reservists with relevant, unit-specific information. The app includes a mobile Common Access Card (CAC) portal that will allow Marines to pair their devices with a mobile CAC reader to access some CAC-secured sites. USMC Connect will increase engagement, communication, and connectedness through greater access to career, lifestyle and behavioral health resources.

The Marine Corps Reserve Substance Abuse program continues to educate Marines on substance misuse, relationships, stress management, emotional regulation, thinking patterns, and risk awareness. The program provides tools to promote the safety of Marines and their families and to sustain and improve personal readiness and unit performance. The Marine Corps Reserve relies profoundly on its Drug Demand Reduction Program, which uses random urinalysis testing to deter the use of illicit drugs and misuse of prescription drugs. Each Reserve unit conducts monthly drug testing to screen Reserve Marines for drugs, as well as breathalyzer testing to screen for alcohol use while in a duty status. The Substance Abuse program staff provides quarterly and on-demand education and awareness training on the dangers of misusing and abusing prescription drugs as well as information on the proper disposal of unused and outdated medications. Additionally, the Substance Abuse program increases leaders' awareness of the dangers of abusing prescription drugs through annual supervisor-level substance abuse training.

The Marine Corps Reserve recognizes that the factors contributing to suicide are numerous and complex. Risk factors can include depression, family history of suicide, and substance abuse. Common precipitating stressors include relationship, legal, and financial challenges as well as disciplinary problems. We mitigate stressors using a multidimensional and multilevel approach.

Small unit leaders are encouraged to foster a sense of belonging for Marines. Commanders employ messaging to safely and effectively communicate about suicide, conduct Force Preservation Councils to identify risk factors, and provide courses of action to mitigate destructive behavior. Once a possible behavioral health issue has been identified, the command implements intervention and reintegration strategies, as appropriate, to help lower risks, encourages Marines to ask for help when needed, and restricts access to lethal means for those at risk for suicide in accordance with existing laws and policies. The Marine Corps' Unit Marine Awareness and Prevention Integrated Training (UMAPIT) teaches every Marine the basics of suicide prevention. UMAPIT consists of tailored curricula designed to proactively manage challenging situations and improve Marines' ability to address behavioral health issues such as substance abuse, suicide, family maltreatment, and combat operational stress before they become unmanageable. The Marine Corps' culture is shifting toward recognizing that seeking help is a sign of strength, which will help reduce stigma and barriers to seeking care. Finally, all Marines are taught to recognize suicide warning signs, seek help for their fellow Marines, and never leave a Marine behind.

Care Management Teams focus on supporting Reserve Marines through the Department of Veterans Affairs Transition Care Management Program. Our Marines are assigned a Care Manager who oversees the referrals and follow-on care of the Reserve Marine's individual health care needs. Marine Intercept Program (MIP) is an evidence-informed, targeted intervention for service members who have had an identified suicide ideation or suicide attempt. MIP includes a series of telephonic contacts in which a counselor reaches out to the Marine and assesses them for risk, encourages the use of a safety plan, and identifies and addresses barriers to services or resources. The MIP counselors then incorporate these contacts into the counseling process. These services are also provided to our Reserve Marines through the PHOP.

Our Marines have proven their strength in navigating challenging issues such as frequent moves, deployments, and separations from loved ones. To help with these struggles, our Marines, Sailors, and family members are able to access behavioral health programs at Marine Corps installations through Marine Corps Community Services (MCCS) while on active-duty orders. Additionally, we continue to support Military OneSource which provides confidential, non-medical counseling, resources, and support to service members and their families anywhere in the world.

SEXUAL ASSAULT PREVENTION & RESPONSE

Sexual assault is a complex and challenging matter that is often interrelated with readiness challenges, behavioral health issues, and destructive behaviors. For the Marine Corps Reserve, addressing the health and safety of our service members and fostering a culture of dignity and respect are top priorities toward reducing and ultimately eliminating sexual assault within our ranks. To accomplish this goal, the

Marine Corps Reserve executes a Sexual Assault Prevention and Response (SAPR) program. Seven full-time, professional employees ensure the efficacy of the program and its services across our geographically-dispersed force. In addition to the force level Sexual Assault Response Coordinator (SARC), each Major Subordinate Command (MSC) within the Marine Corps Reserve has a full-time civilian SARC who serves as a special staff officer to their Commanding General and manages their SAPR program from Marine Forces Reserve headquarters in New Orleans, LA. The program also has two professional civilian SAPR Victim Advocates (VAs) who travel to Marines, Sailors and their families to provide in-person advocacy services, training, and unit-specific program guidance. The Marine Corps Reserve works diligently to improve our victim response, outreach, and sexual assault prevention by approaching these efforts as a team. The SARCs and VAs work together to ensure there is never a gap in coverage, regardless of the MSC. Leaders at every level and anyone in need of support services has access to a SAPR staff member for program guidance.

The SAPR staff trains up to 160 individuals to become VAs each year during courses held quarterly in New Orleans. After completing the 40-hour training course, these potential VAs submit an application for credentialing through the DoD's Sexual Assault Advocate Certification Program. Once credentialed, the VAs are officially appointed by their commanders to serve in the billet at their respective RTCs. In total, the Marine Corps Reserve maintains an active roster averaging more than 200 VAs across the country.

SAPR personnel respond to Marines, Sailors, and adult dependents who request support services related to a report of sexual assault. The SARCs and VAs screen for potential safety issues, develop individualized safety plans, and offer advocacy services and referrals in the military and civilian sectors. In order to more effectively support the Reserve Component, the SAPR Program developed and maintains a database of nationwide resources for victims of sexual assault who may not have access to military providers.

The Marine Corps Reserve operates a dedicated Sexual Assault Support Line that is staffed by the professional SAPR team 24/7. The Marine Corps Reserve also actively publicizes the DoD Safe Helpline, an additional resource that offers crisis support services for members of the DoD community. The DoD Safe Helpline is available 24/7 worldwide with "click/call/text" user options and can be used anonymously for confidential support.

The Marine Corps Reserve's prevention strategy is holistic and integrated with other programs aimed toward eradicating sexual assault, such as the Equal Opportunity Program, Safety, Spiritual Readiness Initiatives, the PHOP, Total Force Fitness initiatives, and Behavioral Health. The Marine Corps Reserve continues to set the example by employing a zero-tolerance policy related to sexual assault and harassment and a retaliation-free command climate. Leaders at every level are encouraged to actively engage with Marines and Sailors to create a positive environment free from attitudes and behaviors that are incompatible with our core values. Each year all Marines and Sailors receive SAPR training which covers reporting options, available resources, and prevention techniques. Along with overall education about the SAPR program, these periods of instruction give individual Marines and Sailors an opportunity to interact with their local Command SAPR Representatives, thereby helping to generate trust in the program and confidence that the prevention of sexual assault is a priority for leadership.

QUALITY OF LIFE

The Marine Corps Reserve strives to achieve appropriate balance and effective performance of our quality of life programs which provide support and assistance during deployment and on the home front. The Marine Corps Reserve is dispersed throughout the country and away from most traditional brick and mortar resources available at major bases and stations. The ability to access the comprehensive set of MCCS programs, which support operational readiness, war fighting capabilities, and quality of life, can have a profoundly positive effect on the well-being of our Marines and families. MCCS programming includes education and transition assistance, fitness and recreation, deployment support, family team building, and prevention. MCCS is a user-friendly and responsive single resource that provides constant and unwavering support to Marines and their families throughout their entire service or affiliation with the Marine Corps. The MCCS Unit, Personal, and Family Readiness Program is supported by civilian Deployment Readiness Coordinators or Uniformed Readiness Coordinators who implement a commander's family readiness vision and help Marines, Sailors, and families maintain a constant state of family readiness.

MCCS programs remain flexible, constantly adjusting to meet the needs of our geographically dispersed Marines and their families. The training programs provided to our commanders, Family Readiness Command Teams, Marines, and their families help to produce a ready and resilient force equipped to achieve success. The Marine Corps Family Team Building (MCFTB) program promotes readiness and resiliency through non-clinical preventative education, professional training, and community-building support to Marines and Sailors and their families throughout mission, life, and career events. MCFTB training events are delivered both in person and virtually through interactive webinars at 158 RTCs. During FY20, the Marine Corps Reserve conducted 169 training events in which 6,854 Marines and family members received valuable information to prepare for and thrive during deployments and achieve a positive post-deployment reintegration experience.

A key component to our quality of life and resiliency is the religious ministry support provided by 141 Religious Ministry Team (RMT) members. As uniformed service members, RMTs support Marines and their families across the full spectrum of military life including combat and humanitarian engagements. There are 87 RMT members embedded in 46 Marine Corps Reserve units across the country. The religious ministry support includes developing the Commandant's spiritual readiness initiatives as part of the Human Performance Division, providing divine services across the spectrum of faith communities, advising on spiritual and ethical matters, and delivering pastoral care in a safe and confidential environment. Chaplain support is provided to Marines, Sailors, and families at numerous funeral services year-round. The Chaplains provide spiritual guidance at the services and follow-on care as needed, providing a source of healing for family members.

The Chaplain Religious Enrichment Development Operations (CREDO) program provides transformational retreats and workshops, including the Marriage Enrichment Retreat (MER), the Personal Resiliency Retreat (PRR) and the Applied Suicide Intervention Skills Training (ASIST) class. The MER and PRR equip Marines, Sailors, and their families with practical relationship and communication tools that strengthen marriages and individual resiliency on the home front and during deployments. The PRR helps Marines and Sailors set personal goals, make good decisions, deal with stress, and live their lives with greater purpose and satisfaction. During FY20, 235 individuals participated in five MERs and one PRR.

In an ongoing effort to reduce suicidal events, the CREDO Program offers ASIST and Suicide Alertness for Everyone (safETALK), evidence-based programs that train individuals to intervene in suicidal ideations and keep the individual safe until they can receive follow-on care. A total of 122 personnel were trained at six ASIST and three safETALK classes in FY20, providing commands with resources to offer positive outcomes in unit readiness. Participants in these programs self-reported a 68% increase in their likelihood to intervene to help a person having thoughts of suicide. One FY20 enhancement of the program has been a "take it to where the Marines are" option with three of the workshops taking place in conjunction with travel to distant geographic locations.

COVID-19 has significantly impacted the operational tempo of the CREDO Program, inhibiting travel for in-person training and necessitating the cancellation of 10 retreats and five ASIST workshops. The Marine Corps Reserve immediately pivoted to live virtual training in order to continue mission execution. Launching with the motto "Virtual Engagement. Real Impact." the transition incorporated new Leadership and Personal Growth Workshops (LPGW), Marriage Enrichment Workshops (MEW), and Professional Naval Chaplain Workshops (PNCW). The LPGWs and MEWs incorporate goals of the PRRs and MERs, respectively, in a shorter, non-retreat format using MarineNet's Adobe Connect platform. The PNCWs are built to enable the CREDO program to train and equip other Chaplains and leaders with skills that directly and positively impact service members, their families, and Federal Civilian employees. One example of this training is Adobe Connect, which instructs participants on the use of the platform for teaching. The Chaplain of the Marine Corps subsequently instructed all RMTs attached to Marine Corps Units to complete the class in an effort to mitigate COVID-19 impact by equipping RMTs across the enterprise. Pilot partnerships were launched to reduce required resources and simultaneously increase deliverables (e.g., Virtual CREDO, Centers for Adaptive Warfighting, Federal Coaching Network, etc.). In FY20, CREDO conducted 54 virtual and 22 in-person workshops consisting of 680 training hours for more than 2,058 participants.

The Marine Corps emphasizes the importance of readiness for Marines and family members in many areas of life. Personal and Professional Development programs continue to provide training and educational resources to our Marines, Sailors, and their families in a variety of areas. One key program that assists commands, Marines, and family members with readiness is the Command Financial Specialist

(CFS) program. The CFS program provides assistance on a wide array of financial issues to include budgeting, diversifying income, credit and debt management, military/consumer protections, car buying, home options, saving and investing, insurance, Survivor Benefit Program, Veteran benefits, retirement, and financial counseling to all members of our dispersed forces.

The technical expertise our Marines have achieved during their service has considerable value to the country's civilian sector. The Marine Corps' Transition Readiness Program emphasizes a proactive approach that enables Marines to formulate effective post-transition entrepreneurship, employment, and educational goals. A virtual transition readiness seminar is available for Reserve Marines and Sailors who are unable to attend an installation-based transition course. The Marine for Life Network links our Marines to employment, education, and community resources in their hometown areas to support their future goals. Tutor.com offers our Marines and their dependents access to 24/7, no-cost, live tutoring services for grades K-12 and college students. Our Marines are also provided with remote access to language courses through Mango Languages, which supports over 70 languages, including English as a Second Language (ESL). Peterson's Online Academic Skills Course helps Marines build math and verbal skills to excel on the job, pass exams, and advance their careers and education.

The Marine Corps' Semper Fit program is fully engaged in partnering with our bases and stations to provide fitness education activities that promote physical and mental readiness and develop positive self-esteem and healthy lifestyles. Additionally, the High Intensity Tactical Training (HITT) program focuses on physical resilience, combat readiness, and injury prevention. The HITT program provides hands-on, science-based strength and conditioning courses and online physical fitness tools to include instruction on injury prevention, nutrition, and weight management. Our Marines' and Sailors' quality of life is also strengthened through team building and esprit de corps activities such as unit outings and participation in competitive events. These programs are vital to unit cohesion and camaraderie.

The Yellow Ribbon Reintegration Program (YRRP) is a DoD-wide effort to promote the well-being of National Guard and Reserve members, their families, and communities by connecting them with resources throughout the deployment cycle. The YRRP is an enduring and invaluable part of our efforts to build resiliency. Since its inception in 2010, we have conducted more than 922 training events for more than 52,000 Marines, Sailors, and family members. In FY20, we conducted three live and 22 virtual events with more than 3,000 participants.

Our Marines, Sailors, and their families who sacrifice so much for our nation's defense should not be asked to sacrifice their quality of life. We continue to be a faithful advocate for flexible quality of life programs and services that evolve and adapt to the changing needs of our Marines, Sailors, and their families. The combined effect of these programs and services is critical to the readiness and retention of our Marines, Sailors, and their families.

SUPPORTING OUR WOUNDED, ILL, OR INJURED MARINES AND THEIR FAMILIES

The Marine Corps ensures the availability of full spectrum care to all wounded, ill, or injured (WII) service members, whether they are Active or Reserve, through the Wounded Warrior Regiment (WWR). The Marine Corps Reserve ensures Reserve Marines' unique challenges are addressed through a WWR Liaison Officer who provides subject matter expertise and special coordination with the WWR staff.

The WWR staff includes the Reserve Medical Entitlements Determination Section, which maintains specific oversight of all Reservists requiring medical care for service-incurred and duty-limiting medical conditions. Reservists facing complex care and recovery needs have access to WWR's network of 45 Recovery Care Coordinators who provide one-on-one transition support and resource identification for WII Reservists and families often living long distances from military installations. WWR also has medical advocates at the regimental staff who are available to assist Reservists in need of medical care coordination and advocacy. District Injured Support Coordinators dispersed throughout the country also coordinate with Reserve units to ensure we keep faith with all Marines.

The Marine Corps Reserve will not forget the sacrifices our Marines have made for this great nation and we will continue to work with the WWR to establish resources and programs that address the unique and ongoing needs of our Reserve population.

FORCE DESIGN

The Marine Corps Reserve, operating as both a strategic and operational reserve, remains a critical part of the Marine Corps Total Force. As the Marine Corps transi-

tions towards Naval Campaigning in response to Great Power Competition, the Reserve Component continues to be an integral element of the planning effort. The Marine Corps force development process is accomplished through deliberate integrated planning teams and comprehensive wargames. The Marine Corps Reserve provides support to this force design effort, while remaining a vital global contributor to meeting Combatant Command requirements.

Although there have been significant adjustments to the Active Component forces, the redesign of the Reserve Component has yet to mature to the point of implementation. While there has been some public mention of specific units identified for deactivation, there is still much deliberation occurring to ensure Reserve capabilities are not inadvertently or prematurely eliminated. Currently, only the deactivations of 4th Tank Battalion and Bridging units across the Marine Corps have impacted the Marine Corps Reserve. The Marine Corps Reserve has been working tirelessly to ensure that each Marine affected by unit deactivations is afforded every opportunity to continue their service to the country. To that end, Personnel Transition Teams (PTTs) have been traveling to all impacted locations to meet individually with all Marines. As it relates to the siting of Reserve units across the country, we are actively analyzing a variety of factors to ensure that if we encounter a situation that forces us to vacate a location, we have both the quantitative as well as qualitative measures to substantiate difficult decisions. As we continue to analyze Service requirements, our site support organizations will remain in place until greater clarity of force design implications are known. The Service is dedicated to maintaining an optimal set of sites for Reserve capabilities in support of the future Marine Corps.

TALENT MANAGEMENT

The legacy Industrial Age manpower management processes we use today will not support our larger force design goal. As the Marine Corps continues to develop talent management objectives in support of departmental objectives, there are unique opportunities worth exploring within the Reserve Component. Our nation's Reservists feel inspired to answer the call to service and are willing to dedicate the requisite time to develop dual careers. The Marine Corps Reserve is actively engaged in developing and managing talent and is currently developing a Reserve Component talent management strategy that aligns the institution's vision, mission, and goals for how talent should be managed to increase warfighting effectiveness while instilling the institution's values. This talent management vision will focus on talent development, leadership development, and diversity & empowerment in order to attract, recruit, identify, incentivize, and retain the most talented individuals across the entire force necessary to achieve institutional and strategic objectives.

CONCLUSION

Your Marine Corps Reserve is forward deployed supporting Combatant Commanders' requirements, participating in Service- and Joint-level exercises both at home and abroad, and is the constant face of the Marine Corps to our local communities. As part of the Total Force, we are focused on force design, readiness, and manpower to maintain and enhance our Service's ability to deter pacing threats as prescribed by the National Defense Strategy. Given a worthy mission and a clear signal that their individual contributions are valued by the Service, your Reserve Marines will continue to answer their "irrational call to service." With your continued support, we will remain ready. Semper Fidelis!

Senator TESTER. Thank you, General.

Next up, we have Lieutenant General Jody J. Daniels, Chief of the Army Reserve.

STATEMENT OF LIEUTENANT GENERAL JODY J. DANIELS, CHIEF, U.S. ARMY RESERVE

General DANIELS. Chairman Tester, Ranking Member Shelby, Distinguished Members of the Subcommittee, on behalf of the 200,000 soldiers and civilian employees of the U.S. Army Reserve, thank you for the opportunity to testify before you today and for your continued support for our soldiers, families, and employers.

In an era of great power competition, the Army needs forces able to compete with adversaries, respond to crises, win in conflict, and prepare for the future.

That mission requires a dedicated Federal Reserve force that is ready now and prepared to meet the challenges of tomorrow. That force is the United States Army Reserve.

At the cost of just 6 percent of the total Army budget, the Army Reserve provides 20 percent of the total force, nearly half of the Army's maneuver support, a quarter of its force mobilization capability, and a myriad of other unique capabilities.

Over the last 3 years, the Army Reserve has focused on rebuilding collective readiness to win near-peer large-scale combat operations as we transform into a force capable of providing multi-domain operations.

However, last year, like the rest of the world, we encountered an unforeseen threat but our readiness paid dividends in unexpected ways. Within 24 hours of the President invoking involuntary mobilization authority in response to COVID-19, the Army Reserve aggregated critical medical capabilities and initiated one of the largest domestic mobilizations in our history.

Within days, we assembled over 2,800 soldiers, including 1,200 healthcare professionals, and deployed them into critical crisis zones around the country. To date, over 4,500 Army Reserve soldiers have mobilized to support our Nation's COVID-19 response.

The Army Reserve continues to support the COVID-19 response operations while prioritizing the readiness and training of our soldiers and formations. Early in the pandemic, we focused on individual readiness and began using cloud-based tools to conduct virtual battle assemblies. We also implemented control measures to decrease risks during in-person gatherings.

Despite an uncertain training environment, the Army Reserve continues to support combatant commanders. Since March 1, 2020, we have mobilized almost 18,000 soldiers, 268 units to support operations around the globe.

We have also developed a readiness concept known as the Army Reserve Mission Force or ARM Force to prepare our formations for the four Cs: competition, crisis, conflict, and change. The ARM Force is under the Army's regionally-aligned Readiness and Modernization Model or REARM and provides a common sense framework to align resources across the component and unit readiness cycles.

This approach ensures that we have sufficient readiness to support our combatant commands while responsibly investing in the modernization necessary for the future fight.

While maintaining readiness, we are also shaping tomorrow by bringing innovation and depth to Army modernization efforts. We created the 75th Innovation Command to act as technology scouts and we are leveraging the vast subject matter expertise gained through our civilian careers to assist Army Futures Command.

However, all this means nothing without our soldiers and our formations. We need ready and resilient soldiers, capable leaders, cohesive teams, strong families, and supportive employers to ensure our success.

To that end, we are aggressively addressing behaviors that destroy our squads. Sexual assaults, sexual harassment, extremism, and racism run counter to our Army values. We are embracing the philosophy of this is my squad to build a culture of dignity and respect and assure all believe their lives are worth living.

Sustaining critical operational capabilities requires adequate and predictable funding. We are grateful for the consistent appropriations that positively impact Army readiness and modernization efforts meet the needs of the Army and our combatant commands across the full range of military operations, including support of National Guard and Reserve equipping account.

The future holds many challenges, but today's Army Reserve is the best-trained, best-equipped, and striving every day to be the most ready Army Reserve in our Nation's history.

With your continued support, we will continue to build on our strong foundation to meet the needs of the Nation and shape the Army Reserve of tomorrow.

Thank you and I look forward to your questions.

[The statement follows:]

PREPARED STATEMENT OF LIEUTENANT GENERAL JODY J. DANIELS

THE UNITED STATES ARMY RESERVE

READY NOW! SHAPING TOMORROW . . .

The State of the Army Reserve—Ready Now! Shaping Tomorrow

In an era of great power competition, the Army needs forces able to compete with adversaries, respond to crises, win in conflict, and prepare for the future. To accomplish this mission, the Army needs a dedicated Federal Reserve force that is ready today and prepared to meet the challenges of tomorrow. That force is the United States Army Reserve.

The Army Reserve is Ready Now, providing Soldiers and units to Combatant Commanders, enabling competition around the globe, supporting civil authorities in the homeland and conducting the foundational training required to win in great power conflict.

190,000 Army Reserve Soldiers and 11,000 Civilians are present in all 50 States, 5 U.S. territories, and deployed to 23 countries around the world. The Army Reserve contains nearly half of the Army's maneuver support and a quarter of its force mobilization capacity at a cost of just 6% of the total Army budget.

Although the Army Reserve only constitutes 20% of the Army's personnel, it provides over 50% of its quartermaster and medical formations, over 80% of its civil affairs, legal, and religious units, 62% of its military information support operations units, and over 40% of its chemical, transportation, ordnance, and intelligence forces. It provides the cornerstone of critical enabling capabilities like petroleum distribution, water purification, port opening, technical intelligence, and railroad operations.

The Joint Force cannot deploy, fight, and win without the Army Reserve. The Army provides the bulk of sustainment and enabling forces to other Services, and most of these enabling forces reside in the Army Reserve.

While the Army Reserve maintains readiness, it is also Shaping Tomorrow by bringing innovation and depth to Army modernization efforts. Army Reserve talent is an integral part of Army Modernization efforts. The Army Reserve has a higher proportion of Soldiers with graduate degrees than any other Army component. Nine percent of Army Reserve Officers have doctorates and over 32% have Masters degrees.

Talent is not limited to the Officer ranks. More than 13% of Army Reserve Enlisted Soldiers have Bachelors degrees. We have Enlisted Soldiers who are investment bankers, executives, and technologists. The call to service attracts individuals from all walks of life and professions.

Our Soldiers live in two worlds. They bring their civilian experiences to bear in their military duties and their innovative mindsets, acquisition skills, and project management expertise help solve the Army's most complex challenges. As the Army

moves towards the conduct of multi-domain operations, our Soldiers will play a critical role in linking the private sector into the defense enterprise. Our pools of talent in areas like defensive cyber operations and additive manufacturing are valuable wells of capability ready for the Nation to tap. Part-time service is a valuable mechanism to attract talent that might otherwise forgo military service.

Soldiers, Civilians and Families are the centerpiece of our efforts to stay ready and evolve. Ready and resilient Soldiers, capable leaders, cohesive teams, strong families, and supportive employers are the key to a ready and capable Army Reserve.

Ready Now! And COVID-19

Over the last three years, the Army Reserve focused on rebuilding collective readiness to contend with a near peer in Large-Scale Combat Operations (LSCO). However, in March of 2020, like the rest of the world, we encountered an unforeseen threat.

Our readiness paid dividends in unexpected ways. Within 24 hours of the President invoking involuntary mobilization authority, the Army Reserve rapidly aggregated critical medical capabilities in response to the COVID-19 Pandemic and initiated one of the largest domestic mobilizations in its history. In days, the Army Reserve assembled over 2,800 Soldiers, including 1,200 healthcare professionals, and deployed them to crisis zones around the country. By mid-April, 15 custom-built UAMTFs—Urban Augmentation Medical Task Forces—prepared to treat patients in New York, Seattle, Detroit, Boston, Philadelphia, New Jersey, and Connecticut. Each of these UAMTFs had the capacity to man a 240-bed hospital and relieve some of the burden falling on our civilian medical infrastructure at the start of the pandemic.

In addition to direct medical support, the 76th Operational Response Command and 807th Medical Command controlled forces across the United States; the 377th Theater Support Command and 4th Expeditionary Sustainment Command provided logistics to units from all components; the 505th Intelligence Brigade helped U.S. Army North track COVID's spread, and 180 Emergency Preparedness Liaison Officers (EPLOs) integrated federal, state, and local responses. Forward Engineering Support Teams helped to convert commercial buildings into hospitals, contractor support personnel arranged for vital services, and Army Reserve Aviation units flew over 600 missions, moving 1,870 personnel and over 8,000 pounds of cargo to points of critical need around the country.

Outside of the United States, Army Reserve formations assisted our allies and overseas installations with their pandemic response. In Europe, the 7th Mission Support Command provided Civil Support Teams to decontaminate high traffic areas across the U.S. Army Garrison in Kaiserslautern, Germany, and performed COVID-19 testing and analysis in Poland. The Medical Support Unit-Europe delivered medical supplies, and the 9th Mission Support Command based in Hawaii deployed nurses, medical planners and EPLOs, supported three federal staging areas, and moved more than 11,500 pieces of Personal Protective Equipment (PPE) and medical gear into the Pacific Territories, Hawaii, and Alaska.

In total, between March 1, 2020, and March 15, 2021, 4,578 Army Reserve Soldiers mobilized to support the Nation's COVID-19 response.

The Army Reserve continues to train while maintaining support to U.S. Army North in COVID-19 operations around the country. Early in the pandemic, the Army Reserve began making use of cloud-based tools to conduct virtual battle assemblies.

Army Reserve Cyber Soldiers continued required individual and team collective training through use of the Persistent Cyber Training Environment (PCTE), enabling Soldiers to complete complex cyber exercises while geographically separated. This synthetic training environment enabled Soldiers to collaborate via the Internet from personal computers, which maintained individual training and readiness goals for the year.

When conditions permitted, Army Reserve units transitioned to team- and squad-level collective training with the intention of getting back to normal operations where possible. Units incorporated medical screening procedures, testing (as available), and control measures to decrease risk during in-person gatherings. Leaders also utilized innovative tools that provided real-time data on area infection rates to make informed decisions on the risks of conducting collective training.

None of these activities and operations prevented the Army Reserve from supporting Combatant Commanders. Since March 1, 2020, the Army Reserve mobilized 17,894 Soldiers in 268 units to support operations around the globe.

The Army Reserve will continue to implement measures to mitigate the risk imposed by COVID-19 to keep Army Reserve Soldiers and their families healthy and

safe, and to ensure that the Army Reserve is ready to defend the Nation against any threat to our national security interests at home or abroad.

Shaping Tomorrow... and the Army Reserve Mission Force

In addition to resuming challenging collective training, supporting the Nation's COVID-19 response, and providing trained Soldiers and units to Combatant Commanders, the Army Reserve developed a readiness concept known as Army Reserve Mission Force (ARM Force) to prepare our formations for competition, crisis, conflict, and change.

The ARM Force prioritizes resources and support for units based on mission alignment. Forces earmarked for competition or conflict receive highest priority, followed by those designated to modernize or generate forces in case of full-scale mobilization. ARM Force nests under the Army's Regionally Aligned Readiness and Modernization Model (ReARMM) and provides a commonsense framework to align resources across the component. The concept complements ReARMM's efforts to transform the Army into a multi domain-capable force by aligning current force structure against competition requirements, and providing predictable mission cycles that allow for training and modernization.

The ARM Force is just one part of how the Army Reserve aims to shape tomorrow, a journey we are pursuing with the Total Army. The Army Reserve is heavily engaged in shaping future capabilities from Information Advantage to next-generation Protection with investments in systems like Joint Battle Command-Platforms to ensure interoperability with the Total Army.

While still in early stages of operation, the Army Reserve's 75th Innovation Command (75IC) currently adds value to the Army, Army Futures Command, U.S. Army Reserve Command, and Combatant Commands by providing relevant technology scouting and critical subject matter expertise, serving as the bridge between the Army's modernization objectives and private sector innovators and technology leaders.

Army Reserve subject matter experts have assisted the Army's Chief Information Officer, the Army Science Board, and Army Futures Command with the critical challenges of cloud computing, cyber security, artificial intelligence implementation and enterprise architecture, and participated in major events such as Project Convergence 2020, Joint Warfighting Assessment 2020, and the Army Software Factory concept.

Personnel from the 75th Innovation Command also serve in key leadership roles for the Defense Innovation Unit (DIU) and the Office of the Chief Technology Officer (CTO) for the Army.

PEOPLE

Modernization, however, means nothing without the Soldiers in our formations. Army Reserve priorities are in line with the Army Senior Leadership. People are our most precious resource and our number one priority.

By investing in our people, we will make our Soldiers, units, and ultimately the Army as a whole, a stronger and more lethal force. Moreover, a "People First" culture builds unit cohesion by creating a foundation of strength, resilience, discipline, inclusiveness and trust that leadership will always take care of their Soldiers.

The Army Reserve is a highly diverse and educated force. In total, the Army Reserve has more Service members who identify as Black, Hispanic, Asian/Pacific Islander, or American Indian/Alaskan Native than any other Reserve component across all branches of service. Twenty-five percent of Army Reserve Soldiers are female.

Diversity extends to the senior leadership of the Army Reserve as well. Women constitute 19% of our General Officers. We also have double the proportion of General Officers who identify as Hispanic or as Asian/Pacific Islander. We expect these numbers to increase even further as individuals from the diverse "Gen-X" and "Millennial" generations reach eligibility for flag rank.

People and diverse teams remain critical to our success in all efforts. We intend to reinforce success by implementing an Army Reserve People Strategy that aims to:

- Continue to create a vibrant and diverse organization with members from all demographics, walks of life, and regions of the United States.
- Strengthen trust across our formations by ensuring people feel valued as members of cohesive, disciplined, and fit teams, rightsizing operational tempo, and supporting programs such as Project Inclusion, Sexual Harassment/Assault Response and Prevention (SHARP), and Equal Opportunity.
- Invest in an improved quality of life for Soldiers and Families by fostering and maintaining supportive relationships with employers and encouraging other

partnerships that enable meaningful Army Reserve service, dual civilian- military career progression, and strong, supportive families, and communities.

—Embrace reform by empowering junior leaders with the authorities and permissions they need to successfully lead and train their Soldiers, and remove unnecessary administrative steps and pointless requirements that stifle progress and hinder informed analysis.

Families and Employers

Readiness depends upon both the Families who support and sustain our Soldiers and the employers who enable them to serve the Army and the Nation. Strong Families are crucial to individual readiness and to overcoming many problems that confront military Families.

The National Defense Strategy relies upon the support of an operational Army Reserve, and our relationships with Families and employers directly impacts our ability to sustain readiness.

Taking Care of Soldiers

“This is My Squad” focuses on building cohesive teams that increase good order and discipline which, in turn, helps ensure that suicide, sexual harassment and assault, and extremism have no place in the Army Reserve. Supporting this philosophy are quarterly foundational readiness events.

Army Reserve Family Programs provide a host of services for Soldiers, Family members, command teams and civilians throughout the geographically dispersed Army Reserve community.

For example, the Army Reserve Volunteer Program promotes and strengthens volunteerism by uniting community efforts and establishing volunteer partnerships.

Suicide Prevention

America's military men and women are strong, dedicated, and resilient. However, physical, mental, and spiritual stress can lead to issues ranging from diminished mission capability to the tragedy of suicide. Without a doubt, years of multiple deployments, frequent family separations, and interruptions of primary careers degraded the capability of geographically-dispersed Soldiers. The social isolation created by the COVID-19 pandemic has increased these stressors.

Army Reserve commanders, leaders, Soldiers, and Civilians share the responsibility to prevent suicide. The Army Reserve is working to increase critical resources and eliminate the stigma associated with seeking help with suicidal ideations and other emotional or psychological issues. Army Reserve commanders are also authorized to place Soldiers serving in an Ask-Care-Escort capacity and those Soldiers at-risk for suicide into a duty status when ideations are identified.

Many tools and resources are available to Soldiers and leaders to increase individual resiliency and prevent suicide. For example, Military OneSource provides free financial counselors for military members facing serious financial issues—a key suicide risk factor.

The Holistic Health and Fitness (H2F) Program is a model aimed at the entire force, not just people in crises. The H2F program focuses on Physical, Nutritional, Mental, Spiritual, and Sleep, to help Soldiers and others improve their overall readiness and learn how to thrive during demanding periods.

Sexual Harassment / Assault Response and Prevention (SHARP)

Sexual harassment and sexual assault prevention and response is critical to preserving individual dignity and unit cohesion at every level. Army Reserve Leaders are focused on promoting awareness, reporting allegations, prosecuting offenders, protecting survivors and creating a positive environment of trust, dignity and respect. Eliminating sexual misconduct in the ranks is critical to increasing personal and organizational readiness.

The Army Reserve's People Strategy reinforces the correlations between sexual harassment and sexual assault and command climate, and empowers both Soldiers and leaders who recognize potential violations to act to prevent and respond to incidents. The strategy reflects the Army Reserve's commitment to safety, respect, inclusiveness, diversity and freedom from sexual harassment and sexual assault.

Sexual harassment and sexual assault training, accountability and victim-recovery programs are a priority in every Army Reserve Command. The Army Reserve is fully committed to creating and maintaining an environment of dignity and respect.

Domestic Extremism

Today, lone offenders and small cells of individuals, including Domestic Violent Extremists (DVEs) constitute the primary terrorist threat inside the United States.

Like all components within the Department of Defense, the Army Reserve is conducting extremism stand-downs that highlight the importance of our oaths to the Constitution, our responsibilities to the Nation as Soldiers, and that involvement with groups that advocate for political violence or crimes of hate run counter to our oaths.

The Army Reserve takes all allegations of Soldier involvement in extremist groups seriously. Extremist ideologies and activities directly oppose our values and beliefs and those who subscribe to extremism have no place in our ranks.

Extremist activity presents a direct threat to readiness and is counter to the "This is My Squad" philosophy. Extremism in the ranks thwarts the Army Reserve's effort to eliminate barriers to team cohesion; puts personnel and facilities at risk from physical assault; hinders recruiting efforts; and breaks trust with the American people.

Resourcing the Army Reserve

Sustaining critical operational capabilities requires consistent, adequate, and predictable funding to ensure the Army Reserve can meet the needs of the Army and our Combatant Commands across the full range of military operations. Ensuring component interoperability across war fighter platforms, such as Communications and Command and Control systems, and addressing gaps identified by the Army in its ability to conduct Large-Scale Combat Operations (LSCO) remains a central challenge.

We are grateful for consistent appropriations that positively impact Army Reserve readiness and modernization efforts which support survivability and lethality on the battlefield.

Ready Now! Shaping Tomorrow . . .

The future holds many challenges, but today's Army Reserve is the best trained, best equipped, and most ready Army Reserve in our Nation's history. We will continue to build on that strong foundation to meet the needs of the Nation and shape the Army Reserve of tomorrow.

Senator TESTER. Thank you, General Daniels.

General Hokanson of the Guard Bureau, you're up.

STATEMENT OF GENERAL DANIEL R. HOKANSON, CHIEF, U.S. NATIONAL GUARD BUREAU

General HOKANSON. Chairman Tester, Ranking Member Shelby, and Distinguished Members of the Subcommittee, it's an honor for our Senior Enlisted Advisor Tony Whitehead and I to join you today on behalf of the soldiers and airmen of your National Guard.

Earlier this month, we reached a key milestone, the 10 millionth person vaccinated against COVID-19 by members of our National Guard. This is not only a reason for hope and relief, it's a testament to our abilities and a triumph of our partnerships.

As a primary combat reserve of the Army and the Air Force, we are manned, trained, and equipped to fight our Nation's wars, but in times of emergency, our people, training, and equipment help us respond to our communities.

Last June, more National Guard troops were mobilized than at any time since World War II. Nearly 120,000 soldiers and airmen were deployed supporting the war fight overseas or involved in domestic operations here at home, and despite the COVID environment, we continued our military training and met every overseas deployment requirement.

In January, in response to the attack on the Capitol, we mobilized and deployed 26,000 National Guardsmen to D.C. within 2 weeks. Using organic National Guard air support and logistics, soldiers and airmen from every State and territory arrived to secure our 59th Presidential Inauguration.

This past year was an extraordinary one for our National Guard and in the interest of time, I'd like to highlight just one weekend,

Labor Day of 2020. That weekend, while many Americans were on holiday, more than 65,000 National Guardsmen were on duty around the globe. Roughly 20,000 were deployed across 34 nations in support of our combatant commanders.

During that same weekend, more than 18,000 were helping their communities fight COVID-19 from manning testing sites to working in food banks so our fellow Americans would not go hungry.

More than 3,500 were helping their communities recover from Hurricane Laura in Texas and Louisiana. More than 2,600 were supporting Customs and Border Patrol on the southwest border. More than 1,500 were protecting the rights of peaceful protesters and safeguarding communities against violence in Georgia, Texas, Kentucky, and Wisconsin.

That same weekend in Alaska, a team of Guardian Angel airmen rescued two hikers, one of who fell more than a hundred feet off a cliff. For their actions, they were awarded the Wilderness Rescue of the Year by the American Red Cross of Alaska.

And still on that same weekend, especially modified C-130s from the California and Nevada Air National Guard, along with helicopters and unmanned aircraft from multiple States, were fighting record wildfires. This included the dramatic rescue of 240 people trapped by wildfires in the Sierra National Forest by the California National Guard's 40th Combat Aviation Brigade. This daring night rescue in heavy smoke was possible because our crews were equipped with modernized helicopters and the latest generation night vision goggles. For their heroism and extraordinary achievement, the air crews were awarded the Distinguished Flying Cross.

This one weekend is just one of many weekends for the National Guard. Our country and our communities needed us, so our Guardsmen left their families and their civilian jobs and proudly served as soldiers and airmen. Their selfless service is both important and inspiring and is reflected in our recruiting and retention.

It's no surprise the National Guard was ready for the challenges we faced in 2020 and continue to face in 2021. This would not have been possible without your investments over the last 20 years that transformed the National Guard from a strategic reserve to today's operational reserve.

I'm grateful for the committee's support in helping provide our soldiers and airmen the facilities, equipment, and training resources they need to be interoperable on the battlefield and responsive in our communities.

Combined with our partnerships at every level, from local first responders to FEMA (Federal Emergency Management Agency) to our 82 international state partnerships, we are posturing for the future. However, there are still places we fall short.

Our equipment must be deployable, sustainable, and interoperable. Our facilities must be repaired or replaced if they're no longer functional, and our full-time support must increase so we can better manage our resources and, most importantly, our people.

There are also distractions our soldiers and airmen face every day. If they don't have healthcare, what happens if they get hurt or injured after they come off orders? If they're doing the same job as their Active or Reserve counterparts, why are they treated dif-

ferently? If they've invested their career in the Space Mission, will there still be a home for them in the National Guard?

Every day our team is working to address these issues and their solutions. I am committed to working with the Army and the Air Force and you to find them.

Among my most pressing concerns are premium free healthcare for Guardsmen, the establishment of a Space National Guard, and elevating six of our general officers commensurate to the levels of their responsibility. These are strategically important issues and they are the right thing to do.

The National Guard is about 20 percent of our Joint Force and anything that impacts our readiness reduces our Nation's ability to deter and makes us less competitive, less capable, and less lethal.

Help us keep our promise to remain always ready, always there.

Thank you for the opportunity to be here. I look forward to your questions.

[The statement follows:]

PREPARED STATEMENT OF GENERAL DANIEL HOKANSON

The National Guard is a lethal, cost-effective, dual-role operational force that provides strategic depth to the Army, Air Force, and Space Force, and responds to crises in our homeland. We are capable of operating in a complex global security environment and continue to invest in modernization and readiness to prepare for the threats of the future. Today's National Guard is an integral part in addressing the gravest challenges facing the Joint Force.

Globally, China, Russia, Iran, North Korea, and violent extremist organizations continue to present significant threats to U.S. prosperity and security. At home, our adversaries use of cyber-attacks and disinformation threaten our democracy while the growing frequency and severity of hurricanes, wildfires, floods, and a global pandemic challenge the safety of our citizens and communities.

The year 2020 was unprecedented and historic. National Guard members supported every Combatant Commander around the globe and met every mission here at home. On June 6, 120,000 National Guard Soldiers and Airmen were mobilized in support of overseas and domestic missions, one of the highest levels of National Guard support to our nation since World War II.

Given the uncertain future and budget priorities, we expect the Department of Defense to rely on the National Guard more, not less. Therefore, we must be ready to execute our three core missions: fighting America's wars; securing the homeland; and building enduring partnerships that support our nation's strategic objectives. Continued investment in the National Guard ensures we can meet today's demands while preserving the capability, capacity and deterrence our nation needs against a broad spectrum of potential future threats.

WARFIGHT

The National Guard is the primary combat reserve of the Army and Air Force, and provides operational capability to the Space Force. We provide enduring, rotational, surge, and follow-on forces to meet any Joint Force mission. Today, thanks to the substantial investment in training, equipment and readiness by Congress and DOD leaders, we have become the most capable, professional, ready, and combat proven National Guard in the history of the United States.

In 2020, Soldiers with the North Carolina Army National Guard's 30th Armored Brigade Combat Team, who tested their combat skills at the National Training Center in 2019, returned from their deployment to Kuwait and Syria and began supporting their communities COVID-19 response efforts and civil disturbance missions. Also in 2020, the Idaho Air National Guard's 124th Fighter Wing deployed their A-10s and Airmen to the region as well. The 124th's deployment, the wing's second-largest ever, required pilots, security forces, maintainers, medical personnel, special warfare tactical air controllers and staffers to support operations across two continents.

The National Guard is also a trusted space and cyber partner. For 25 years, National Guard space units have provided operational, unit-equipped, surge-to-war capability to protect our nation's vital interests in this contested domain and today supply the Space Force with 11 percent of its space professionals and 60% of offen-

sive Electronic Warfare capability. In addition, our cyber warriors bring their military and civilian skillsets to bear in support of Cyber Command's global commitments.

Two decades of investment and modernization in the National Guard has paid measurable dividends to our Joint Force's lethality and our nation's security.

HOMELAND

Unique to the National Guard is our ability to apply the training and equipment from our wartime missions to our state responses in the homeland. National Guard Soldiers and Airmen logged over 10.9 million days serving our communities in 2020—more than four times as many as 2019.

The events of 2020 required an unprecedented response to various unforeseen events within the homeland. Most significantly, the men and women of the National Guard served more than 7.6 million days in support the COVID-19 pandemic—a mission that continues today. They provided over 632 million meals to neighbors, distributed over 539 million pieces of Personal Protective Equipment (PPE) to essential workers, and tested or screened over 16.1 million people for the virus across the 50 states, 3 territories and the District of Columbia in 2020. In addition, they were called to fight record wildfires in California with specially equipped C-130s, helicopters, MQ-9 drones and shovels; expedited recovery efforts after a record number of named hurricanes battered the Gulf Coast; and provided support to cyber security, cyber assurance and recovery from cyber-attacks at the local, state, and federal levels.

In 2021, your National Guard is making concerted efforts to assist in logistics, distribution, and vaccination of the communities they serve. To date, Guard Soldiers and Airmen have vaccinated millions of civilians, administering well over 150,000 shots a day—with those numbers continuing to grow.

The National Guard's skills and abilities developed for the warfight (such as leadership, training, logistics, and communications), coupled with its unique array of authorities and trusted local, state, and federal partnerships, makes it a natural choice for tackling some of the most difficult challenges we face at home.

PARTNERSHIPS

Building enduring partnerships at the international, federal, state, and local levels contributes to our nation's strength and readiness. Our approach makes the National Guard a force other nations and organizations are eager to partner with.

At the international level, the National Guard's State Partnership Program (SPP) is a key pillar to the Department of Defense's focus on alliances and partnerships. Through the SPP, the National Guard maintains long-term relationships that strengthen alliances, enhance interoperability, reassure allies and deter our adversaries. Improving the military, security and emergency response capacity of partner nations improves their resiliency, benefiting the entire international community. Through 82 SPP partnerships, the National Guard is engaged with 89 nations, 45% of the world's nations, and ensures the Department of Defense has capable, trusted and interoperable partners at our side.

At the federal level, the National Guard maintains productive interagency relationships with the Federal Emergency Management Agency, Department of Homeland Security, Department of Health and Human Services, and U.S. Customs and Border Protection that contribute to rapid and unified responses when disasters strike. Additionally, the National Guard runs several counterdrug schools that offer in-person training courses to federal, state and local law enforcement personnel.

At the local level, we develop partnerships and connections in the communities we serve through efforts such as the National Guard Youth ChalleNge, and DOD's Innovative Readiness Training (IRT) and STARBASE programs. Youth ChalleNge is a community-based program that leads, mentors and trains 16-to-18- year-old, at-risk youths on values, life skills, education, and the self-discipline required to become productive citizens in America's future. The IRT program connects annual military training opportunities with the needs of disadvantaged or remote communities to produce mission-ready forces, civil-military partnerships and strong communities. The STARBASE program also exposes our nation's most underrepresented youths to activities in the Science, Technology, Engineering, and Math (STEM) career fields through a hands-on learning experience at National Guard and other DOD installations across the nation.

CHIEF, NATIONAL GUARD BUREAU

As the 29th Chief of the National Guard Bureau and member of the Joint Chiefs of Staff, I provide input into every decision impacting our Joint Force and advise

the Secretary of Defense on all matters involving the National Guard and the capabilities the National Guard of the 50 states, 3 territories, and District of Columbia provide the Joint Force. The health and welfare of our service members is fundamental to these capabilities, and it's imperative we continue to provide our Soldiers, Airmen, space professionals, families and civilians access to the resources needed to maintain their resilience. Maintaining the welfare of our force also means ensuring our organization continues to promote inclusion, equality, diversity and resilience, with zero tolerance for abuse, harassment or discrimination. Finally, we cannot lose sight of the importance of our employers. Employers are critical to the success of our part-time business model and we must continue to foster an employer-service member relationship that is sustainable and mutually beneficial.

Today's leaders will have to contend with budget pressures, training shortfalls, time constraints and modernization gaps. We must develop leaders capable of performing at today's pace of change; redefine how we train forces and approach readiness; and seek to become more joint and multi-domain minded. This is critical as we look to normalize the capabilities of an operational National Guard within the DOD's processes.

My goal over the next four years is to build on past National Guard accomplishments and contributions to the Joint Force in achieving National Defense Strategy objectives through a continued focus on our three core missions of warfight, homeland and partnerships. I intend to build a sustainable operational force for the future by focusing on four priorities: people, readiness, modernization and reform. Today's National Guard is the most modern, ready and interoperable Joint Force in our 384-year history. However, our adversaries do not rest. We must continue to build a National Guard that is stronger and more responsive, one with greater lethality, global influence and the combat readiness to deter aggression.

ALWAYS READY, ALWAYS THERE

Serving with the 443,000 men and women of the National Guard is an honor. We provide combat-proven forces when needed and tirelessly help our communities where we live. We stand ready to face the threats of today, and prepare for the challenges of tomorrow. Serving in nearly every zip code, and answering the call in nearly every corner of the globe, the National Guard remains Always Ready, Always There!

Army Guard SNAPSHOT

- Provides the Army 39% of its operational forces
- 334,575 Soldiers
- 8 divisions
- 27 Brigade Combat Teams
- 2 Special Forces groups
- 1 Security Force Assistance Brigade
- 42 multifunctional brigades
- 56 functional support brigades and groups
- 13 command & control headquarters
- 24,687 buildings, 1,397 firing ranges, and 110 training centers in 2,416 communities.

Air Guard SNAPSHOT

- Provides the Air Force 30% of its operational forces.
- 108,100 Airmen across 90 wings.
- Manpower contribution to 5 core areas:
 - 10% of Air, Space and Cyber Superiority.
 - 13% of Command and Control/Intelligence, Surveillance and Reconnaissance.
 - 40% of Agile Combat Support.
 - 20% of Rapid Global Mobility.
 - 17% of Global Strike.

1,053 Air Guard Aircraft

- Provides 36% of Air Force's tanker capability.
- Provides 26% of Air Force's fighter/attack capability.
- Provides 30% of Air Force's strategic/tactical airlift capability.
- Operates 15 of 16 Aerospace Control Alert sites.
- Provides 13% of Air Force's overseas MQ-9 Reaper unmanned aerial vehicle capability.

FIGHTING AMERICA'S WARS

Force for the Future

- The National Guard has supported more than one million overseas mobilizations to Iraq, Afghanistan, Kuwait, the Balkans, Guantanamo Bay, the Sinai, and other overseas locations since 9/11.
- National Guard Soldiers and Airmen served more than 10.2 million personnel days supporting warfight missions in 2020.
- More than 20,000 National Guard Soldiers and Airmen are currently deployed in support of missions in Afghanistan, Kuwait, Bahrain, Jordan, Qatar, Ukraine, Poland, Kosovo, Eastern Europe, the Horn of Africa, Central and South America, and the Sinai Peninsula.
- Two National Guard brigades will deploy to the National Training Center in Ft. Irwin, Calif. this year: Mississippi Army Guard's 155th Armored Brigade Combat Team in June; and Oklahoma's 45th Infantry Brigade Combat Team in July.
- Three National Guard brigades will deploy to the Joint Readiness Training Center in Ft. Polk, La. this year: Ohio's 37th Infantry Brigade Combat Team in June; Arkansas's 39th Infantry Brigade Combat Team in July; and Indiana's Security Force Assistance Brigade in August.

Overseas Presence

- The Louisiana Army Guard's 256th Infantry Brigade Combat Team is deployed to Iraq providing Security Forces and conducting Advise and Assist missions with Iraqi Security Forces (ISF) and partner units in the AOR to enhance capabilities and secure critical sites in support of Operation Inherent Resolve.
- The Illinois National Guard's 33rd Infantry Brigade Combat Team is deployed to Ukraine providing training to the Armed Forces of Ukraine to help them develop defense capabilities and build interoperability.
- The South Carolina Army Guard's 678th Air Defense Artillery Brigade is providing command and control to Air and Missile Defense in the U.S. European Command in support of Operation Atlantic Resolve.
- The South Dakota Army Guard's 196th Maneuver Enhancement Brigade is deployed to the Horn of Africa working with the Suriname Defense Force to promote regional security, dissuade conflict, and protect U.S. and coalition interests.
- More than 1,200 Guard Airmen from 48 units served in nine different locations while filling 33% of the Total Force's civil engineer needs overseas last year.
- The Air Guard is providing 25% of the Total Force's Distributed Common Ground System (a system that produces military intelligence for multiple military branches) capacity in direct support of the overseas Combatant Commanders.
- The Texas Army Guard's 36th Infantry Division deployed to Kuwait and provides division-level command and control of Army forces in Kuwait and Jordan in support of Operation Spartan Shield. The Ohio Army Guard's 16th Engineer Brigade is also supporting Spartan Shield by providing engineering expertise, project management, and command of subordinate engineer battalions.
- The Pennsylvania Army Guard's 28th Expeditionary Combat Aviation Brigade is providing command and control of all Army Aviation units in Kuwait in support of Operation Spartan Shield and Operation Inherent Resolve.
- Nearly 1,500 Army Guard Soldiers and 64 aircraft are supporting U.S. Central Command aviation missions in Afghanistan and Kuwait.

SECURING THE HOMELAND

- National Guard Soldiers and Airmen spent a record 10.9 million days serving their communities supporting missions such as COVID-19, wildfires, civil disturbances and hurricanes.
- Air Guard personnel protect the airspace over America by operating 15 of the 16 NORAD Aerospace Control Alert sites and the Eastern and Western air defense sectors. Guard ACA pilots flew 2,058 sorties in FY 2020—1,825 scramble sorties (practice and real-world) and 233 Operation Noble Eagle sorties.
- To allow effective communication between local, state and federal emergency agencies, National Guard Joint Incident Site Communications Capability teams set-up and operated a "self-contained communications package" at the Super Bowl and numerous other major events and exercises last year.
- The 57 full-time National Guard Weapons of Mass Destruction Civil Support Teams carried out 2,475 missions in FY 2020 ranging from no-notice call-outs

to identify substances; to supporting national security events; to training and assisting state partners. CSTs can typically respond in 1 to 3 hours.

- The National Guard runs 17 battalion-sized (nearly 2,400 people) Chemical, Biological Radiological Nuclear (CBRN) Enhanced Response Force Packages or CERFPs in 17 states capable of responding in 3 to 6 hours.
- National Guard Soldiers and Airmen comprise 55 percent of the Defense Department's chemical, biological, radiological, nuclear (CBRN) response capability.

Cyber Centric

- There are more than 3,900 Army and Air National Guard personnel serving in 59 DOD cyber units in 40 states.
- 1,219 Guard members detected 57 “vulnerability events” while supporting the Nov. 3, 2020 national election. They provided their state's IT support; vulnerability assessments; network monitoring; vehicle/foot traffic control; and COVID-19 screening and sanitizing.
- 290 National Guard cyber warriors from 15 states also responded to 33 reported state cyber events in 2020.

Taking Drugs off the Streets

- More than \$11.2 billion of illicit drugs, weapons, property, and currency are off the streets thanks in part to the efforts of over 2,600 National Guard Counterdrug professionals assisting civilian law enforcement agencies throughout the 50 states, 3 territories and DC.
- National Guard counterdrug operations supported 1,362 law enforcement agencies and over 439 community-based organizations.
- Five National Guard counterdrug schools trained nearly 60,000 law enforcement personnel in 2020, using subject matter experts who are able to draw upon their military education, operational experience, and knowledge of DOD capabilities.

10.9 Million Days

When COVID, Wildfires, Civil Disturbances and Severe Weather hit home in 2020, Guard members in each state, territory and DC left their jobs and families to serve their communities—responding in record fashion.

Pandemic Response

- 632 Million: Meals provided by Guard members in 2020.
- 36.9 million: Masks made by Guard members in 2020.
- 16.1 million: People tested or screened for COVID-19 virus by Guard members in 2020.
- 11.5 million: Miles driven to deliver supplies in 2020.
- 2.4 million: Calls answered, made at call centers in 2020.
- 71,259: Facilities deep cleaned by Guard members in 2020.
- 19,211: Increased bed capacity at Alternate Care Facilities in 2020.

Fighting Fires

- Guard members from 19 states logged 155,108 days responding to 52,834 wildfires covering over 9.5 million acres in 2020—Maryland is 7.9 million acres.
- C-130 crews, equipped with U.S. Forest Service Modular Airborne Fire Fighting Systems (MAFFS), flew 470 missions and logged 549 flying hours while dropping over 1.3 million gallons of fire retardant.
- Air Guard RC-26 fixed-wing and MQ-9 Remotely Piloted Aircraft crews logged over 2,000 hours providing real-time fire mapping; evacuation route identification; and new fire/hot spot detection.
- Two California National Guard helicopter crews were awarded the Distinguished Flying Cross for bravery by the President after saving over 200 stranded residents from the Creek Fire.

Supporting Peace

- Guard members from 38 states logged 627,659 days supporting law enforcement agencies in 2020 by providing crowd control, monument/infrastructure security, traffic control, and roving patrol missions.
- At its peak on June 7, 2020, 43,351 Guard Soldiers and Airmen were providing civil disturbance support.

Bringing Calm after the Storms

- Guard members from 22 states supported 22 severe weather events in 2020 and a record 12 named storms.
- During hurricane responses, Guard members rescued 9,812 people; and distributed over 6 million meals, 12.1 million gallons of water, 1.6 million bags of ice,

and nearly 319,000 tarps in 2020. They also cleared over 2,700 miles of road to assist recovery efforts.

- Guard members logged 118,748 personnel days responding to hurricanes and tropical storms; 36,767 days for earthquakes; 11,340 days for floods; 5,106 days for severe weather; 3,502 days for tornadoes; and 1,174 days for winter storms in 2020.

BUILDING PARTNERSHIPS

- Competition with rivals demands greater cooperation with partners. The National Guard's network of 89 allies and partners through the State Partnership Program (SPP) provides our nation a great advantage and directly supports competition objectives outlined in the National Defense Strategy.
- Through the SPP, National Guard and partner nation personnel learn together, work together, and prepare—if necessary—to fight together.
- National Guard Soldiers and Airmen conducted more than 1,200 SPP activities worldwide in support of Geographic Combatant Commands in FY20.
 - Since 9/11, 27 SPP partner countries have contributed troops to coalition operations—15 of those SPP countries deployed forces alongside their National Guard partners.
- The SPP is a cost-effective program that provides DOD decision-makers a proven tool to help address today's security challenges and a wide range of potential future threats.
- The National Guard's reputation in disaster response at home and proven combat capability overseas makes it an attractive partner to nations faced with military and non-military threats.
 - The National Guard plans to grow two new partnerships per year.
- In the homeland, planning and training with local, state and federal responders has resulted in unified and rapid responses to man-made and natural disasters—ultimately, saving more lives and property.

SOLDIERS, AIRMEN AND FAMILIES

- Army National Guard Child and Youth Services conducted over 2,598 events for over 66,800 National Guard youth ages 6–18 in an effort to promote resilience and sustain the quality of life through high-quality support services and enrichment programs. Coordinators transitioned 202 events into virtual/online programming that might have otherwise been canceled as a result of COVID-19.
- The Air National Guard Home Community Care Program is available at over 42 Air National Guard Wings with state accredited providers offering free child care to Guard members. In FY20, the Home Community Care Program, provided over 27,000 hours of child care, spending \$290K, in support of Air National Guard families.
- The Joint Yellow Ribbon Reintegration Program helped over 31,229 service members and families connect with their local community support services before, during, and after deployments by overseeing 440 nationwide events in 2020. The Army National Guard conducted 419 events and supported 26,319 Soldiers and family members, while the Air National Guard conducted 21 events for 4,980 Airman and their families.
- The NGB Employment Support Program reached 102,141 Guard members and provided assistance to 45,385 Guard members, their families, veterans and other reserve component members seeking jobs. The effort resulted in over 4,100 job referrals and nearly 900 hires. Each state has a program support specialist.
- The Employer Support of the Guard and Reserve is a DOD program established in 1972 to promote cooperation and understanding between Reserve Component Service members and their civilian employers. The network of 3,300 volunteers across the nation bring a vast wealth of experience to assist members resolve conflicts arising from an employee's military commitment.
- Transition Assistance Advisors impacted the lives of nearly 189,026 service members and veterans in FY20 by providing support, advocacy and information. Advisors are located at each National Guard Joint Forces Headquarters to provide resource and referral information for such issues as education, employment, VA healthcare enrollment, and disability claims.
- The Army Guard provided over \$36 million in Federal Tuition Assistance benefits to more than 19,000 Soldiers enrolled in over 71,000 courses in FY20.
- The National Guard's Strong Bonds conducted over 630 virtual retreats and events for over 17,600 Soldiers, Airmen, and their families to increase family readiness and resiliency through relationship education and training.

- Army Guard Survivor Outreach Service coordinators assisted 46,708 surviving family members in FY20, an increase of 2% over last fiscal year.
- The National Guard Sexual Assault Prevention and Response Program provided training, services and advocacy to victims of sexual assault with its 134 full-time, nationally certified Sexual Assault Response Coordinators. There are also 1,618 part-time, nationally certified Sexual Assault Response Coordinators and victim advocates.
- The Army Guard's team rendered honors at 94,285 service member funerals in FY20. The funeral honors team is projected to conduct over 104,147 requests to render burial honors for veterans and retirees in FY21.
- Due to the Army National Guard Resilience program's robust training platform, they received HQDA's only exception-to-policy to conduct a 2-week Master Resilience Training certification remotely during the pandemic. The team used the lessons learned to conduct 9 one-week and two-week trainer certification courses, helping to offset attrition caused by 3 canceled classes due to the pandemic. The Resilience program trained 648 total Master Resilience Trainers in FY20, bringing the total number of MRTs trained to 7,297.
- The MRT schoolhouse in Wisconsin is now certified to bring any Resilience, Suicide Prevention and Substance Abuse training to the 50 states, 3 territories and DC upon request. Three Army Guard MRT Mobile Training Teams provided Resilience, Risk Reduction, and Suicide Prevention training 25 times last year.
- The Army National Guard provides 54 Suicide Prevention Program managers, one to each state, territory, and DC. They provided advanced training to 76,479 Soldiers and family members in FY20, enabling them to recognize the signs of suicide, giving them the skills to intervene appropriately, and connect those in need to military and community resources.
- The Army National Guard provides between 1-to-4 contracted Risk Reduction and Prevention Coordinators in each state, territory and DC to help commanders assess high-risk behaviors that are counterproductive to readiness—such as substance abuse, sexual crimes, family violence, and suicide. Despite COVID-19 restrictions, coordinators were able to survey over 150,000 Soldiers in FY20, resulting in remote drills, risk mitigation plans for 2,588 units, and nearly 3,000 prevention training events.

Resilient Warriors

- The Chief, National Guard Bureau established NGB Warrior Resilience and Fitness to ensure multiple programs supporting the well-being and resilience of Guard members and their families are synchronized into a holistic and integrated model that leverages the Total Force Fitness framework.
- Warrior Resilience and Fitness developed a Compendium of Warrior Resilience and Fitness Strategies with over 167 research-informed programs aimed at preventing and responding to suicide, sexual assault, and substance abuse.
- Warrior Resilience and Fitness Innovation Incubator provides funding and technical assistance to 22 pilots across 29 states and territories to assist with implementation and evaluation of programs that promote resilience and prevent harmful behaviors.
- NGB signed a memorandum with the Veteran's Administration to provide greater access to behavioral health services for NG members during drill weekends. The initiative has seen an increase in the number of NG members receiving services during drill weekends (14%) and at Vet Centers (44%).
- SPRINGboard is the first NG-specific readiness tool that will help leaders make more informed decisions about the health of Service members.
- NGB partnered with the Uniform Services University and Purdue University to train community-based behavioral health providers in military culture. More than 800 providers have received specialized training.
- NGB signed a memorandum with Psych Hub to provide NG members with access to the COVID-19 Mental Health Resource Hub that has over 600 videos and podcasts that support mental health and reduce stigma about seeking care.
- NGB and the Marines partnered on the first Innovation, Prevention, and Outreach (IPO) forum to improve behavioral health, access to care, and overall well-being for geographically dispersed Reserve Component members and their families.

Give Teens a Second Chance

- Forty National Guard Youth Challenge and 5 Job Challenge academies across the country have graduated more than 187,923 cadets since the program's inception in 1993. The 5-1/2 month, Youth Challenge in-residence course takes

at-risk 16- to 18-year-olds and teaches them the life skills and self-discipline needed to succeed, while helping them to earn credits toward high school diplomas or prepare them for a GED. The 5-month Job Challenge in-residence program allows some Youth ChalleNGe graduates to obtain job certifications, credentials or apprenticeships to facilitate obtaining living wage jobs.

—Nearly 83% of all ChalleNGe graduates earn their high school diploma, GED or obtain college credits; nearly 32% go on to attend additional college or other schools.

—The per-student-cost for a ChalleNGe graduate averages \$21,450 compared to the almost \$63,000 per-year cost for a youth in juvenile custody.

25 Years in Space

—The National Guard provides our nation and DOD partners a proven capability by supplying 100 percent of its unit-equipped, surge-to-war operational reserve forces.

—Currently, the Air National Guard provides 60 percent of the Space Force's offensive space electronic warfare capability.

—The Air National Guard operates the nation's only survivable and enduring strategic missile warning/nuclear detection capability and provides the nation's strategic missile warning on the High Frontier.

—In support of DOD space missions, NG members conduct training that bolsters space capabilities and enables homeland protection.

—The Air National Guard's 14 space units in 7 states (AK, CA, CO, FL, HI, NY, and OH) and one territory (Guam) are conducting daily missions in support of global Combatant Command operations.

—Long-standing partnerships and civilian employment with state and local space entities, in both the public and private sectors, allows for access, seamless integration and immediate response.

Senator TESTER. Thank you, General Hokanson.

Next up, we have Vice Admiral John Mustin of the Navy Reserve.

STATEMENT OF VICE ADMIRAL JOHN B. MUSTIN, CHIEF, U.S. NAVY RESERVE

Admiral MUSTIN. Chairman Tester, Ranking Member Shelby, and Distinguished Members of the Subcommittee, thank you for the opportunity to appear before you today.

It's my distinct honor to report to you on the status and the vision of America's Navy Reserve.

I'd like to take this opportunity to recognize my wife Kim whose steadfast support through my nearly three-decade Navy career exemplifies the service and sacrifices typical of our military spouses.

I'd also like to express my gratitude to Navy Reserve Force Master Chief Chris Coates, my partner and confidante, who tirelessly advocates for our enlisted Reserve sailors every day.

This is also the perfect time to publicly thank my fellow Reserve service chiefs for their ongoing support, counsel, collaboration, and partnership.

Finally, I'd like to recognize the 109,000 sailors, our nearly 500 dedicated civilians, the families who support them, and the thousands of employers who value and enable the service of our citizen sailors worldwide. They are all equally critical stakeholders in the success of our Navy Reserve.

Your Navy Reserve sailors are flexible and responsive. This past year alone to address the coronavirus-19 pandemic, the Navy Reserve activated more than 7,000 sailors in direct support of the Nation's emergency response.

I remain humbled by their agility, capability, and their sacrifices as well as the enduring support of their families and employers.

Your Reserve force is also a strategic asset. Aligned with the National Defense Strategy, the Tristar Maritime Strategy, and the Chief of Naval Operations Navigation Plan, the Navy Reserve is at an inflection point, pivoting to develop essential strategic depth.

This renewed maritime focus on integrated all-domain naval power will address the provocative behavior we experience daily from a rising China, a resurgent Russia, and other ambitious authoritarian states who seek to disturb global norms and the rules-based international order.

To this end, the singular priority of the Navy Reserve is simple: warfighting readiness. Modernization of our equipment, training systems, and mobilization processes will generate efficiencies that enhance our contribution to the total force at an attractive resource-informed cost.

To ensure our sailors are operating relevant modern equipment, procurement of the Juliet Variant to replace legacy C-130 aircraft is the Navy Reserve's Number 1 equipment priority. With an average age approaching three decades and a mission-capable rate of only 25 percent, the current C-130 Tango Fleet is challenged to meet sustained fleet logistics requirements.

With the mission-capable rate of nearly 75 percent, the KC-130 Juliette, on the other hand, would provide an additional \$200 million per year in transportation cost savings to the Navy.

Similarly, modernization of Navy Reserve high-end adversary aircraft is aligned with the Navy's divestment of legacy FN-18 Hornets. Increasing Navy Reserve capability and capacity to support Navy adversary requirements will extend Active component strike fighter service life while concurrently enabling the dedication of precious fleet aircraft and flight hours to the fleet-specific operational missions they were purchased to perform.

The totality of Navy Reserve modernization also includes enhancing the processes and systems employed to mobilize our sailors. For example, adaptive mobilization will increase current activation capacity 15-fold while reducing the mobilization timeline by over 80 percent, effectively activating the entire force in 30 days.

Integral to this process is the implementation of the Navy personnel and pay system, NP-2, the single-most important administrative enhancement in decades, which will become operational in January of 2022.

Your Reserve sailors are one team. Central and vital to the generation of critical enduring advantage are our people. The Navy Reserve continues to forge a culture of excellence based on the Navy's core values, honor, courage, and commitment, and our four core attributes.

We're dedicated to fostering the diverse inclusive culture that generates our decisive warfighting advantage. They are a winning team and they are ready.

That said, delivering surge and warfighting ready maritime forces to the total force would be impossible without your continued support. Specifically, we appreciate your support in the modernization efforts of the Reserve maritime, patrol, and reconnaissance capability. The acquisition of P-8 Alpha Aircraft ensures the Reserve force continues to deliver necessary operational strategic value across the force.

Additional modernization efforts supported by the National Guard and Reserve Equipment Account, which is vital to ensuring the readiness and lethality of Reserve equipment, and ultimately the timely delivery of a fiscal year 2022 appropriations bill will provide predictability to our sailors, to their families, to their employers, and, most importantly, to our global combatant commanders.

Chairman Tester, Ranking Member Shelby, I remain humbled every day by the commitment and contribution of our citizen sailors, our dedicated civilians, and the supporting families that collectively are your Navy Reserve. They all serve our Nation with distinction every day in every theater around the globe 24/7/365. They are the sentinels of our security.

Their readiness is not coincidental nor guaranteed and yet our Navy and our Nation are counting on them to be ready when called. With your continued support, they will deliver proudly and capably.

I thank you for your support and attention and I welcome your questions.

[The statement follows:]

PREPARED STATEMENT OF VICE ADMIRAL JOHN B. MUSTIN

Chairman Tester, Vice Chairman Shelby, distinguished members of the Committee, it is my distinct pleasure to report to you today on the contribution of the Navy Reserve to the national defense, both as it stands today and as we urgently adapt to address future challenges.

The Navy Reserve, like the Reserve Service of each other military branch, provides the strategic depth and surge capacity necessary to assure the security and prosperity of the United States, whenever and wherever needed. In the two decades since 9/11, the Navy Reserve has executed 93,362 mobilizations, with 69,449 individual Sailors responding to support the global war on terrorism and related military operations and contingencies. This past year, in response to the acute early phase of the Coronavirus-19 (COVID-19) pandemic, the Navy Reserve mobilized to support the missions of USNS COMFORT and USNS MERCY in New York and Los Angeles to relieve overburdened local hospitals. In total, the Navy Reserve has executed 7,310 activations as part of the nation's emergency response to the pandemic, and today nearly 900 Reserve Sailors are serving on active duty in support of COVID-19 related missions. These examples highlight the flexibility, readiness and value our citizen-Sailors provide. And yet, these significant contributions merely hint at what may be required from the Navy Reserve in a future conflict with a near-peer maritime competitor.

As the President recently expressed in his Interim National Security Strategic Guidance, the United States must "renew our enduring advantage" in response to growing rivalries with China, Russia, and another authoritarian states. The Navy, in partnership with the Marine Corps and Coast Guard, is urgently adapting to generate Integrated All-Domain Naval Power to confront these and other emerging challenges, and the Navy Reserve is similarly transforming to prepare for the future. Last year, I issued the Navy Reserve Fighting Instructions, directing the

Reserve Force to adapt to address the challenges authoritarian regimes pose to the free, open, rules-based international order we have enjoyed for decades. Firmly aligned with the Tri-Service Maritime Strategy and the Chief of Naval Operations' (CNO's) Navigation Plan (NAVPLAN), these Fighting Instructions make clear that my number one—and only—priority for the Navy Reserve is warfighting readiness.

The focus on warfighting readiness begins with our people. The Navy Reserve will continue to foster a diverse, inclusive team of Sailors and Civilians who view respect as our cornerstone attribute. We recognize the critical importance of forging cohesive teams that succeed in cooperation, prevail in competition and win in conflict. We are actively addressing extremism and promoting a positive culture based on the Navy's core values of honor, courage, and commitment. Additionally, the Navy Reserve invests heavily in programs that provide services to those at risk for destructive behavior. With the Culture of Excellence Campaign as our foundation, we will continue to modernize the systems supporting our Sailors and target our investments to train a highly effective warfighting force.

While central and critically important, our team of highly trained and motivated Sailors alone will not win the day in a modern conflict. Achieving warfighting readiness also demands that we provide our Sailors with cutting-edge warfare systems and equipment. For capabilities with relatively low peacetime operational requirements, the reserve component is a cost-effective alternative for providing surge capacity during a conflict. To ensure interoperability with the Navy and Joint Force, the Navy Reserve plans to acquire modern capabilities and to upgrade legacy platforms. As we have demonstrated for over a century, investment in Reserve equipment and capabilities provides the Navy with surge capacity for long-term strategic competition at a favorable, resource-informed cost.

Our modern, highly trained fighting force must be capable of surging to the battle quickly. To that end, the Navy Reserve is modernizing its mobilization infrastructure to assure the ability to mobilize the entire Selected Reserve population—roughly 50,000 Sailors—within 30 days. The design and implementation of a distributed activation process will rely on regional and local Navy Reserve Activities to mobilize Reserve Sailors directly to their wartime billets. Advanced data analytics will allow us to better predict and address the availability of Sailors for mobilization. We are also leveraging information technology to create efficiencies that enable operational capability for our geographically distributed force. Together, these changes will make the Selected Reserve more responsive and accessible to emergent crises and conflict.

Timely, predictable and relevant funding from Congress is critical for the Navy Reserve to meet mission requirements and, as always, we are grateful for your continued support and enduring interest. Specifically, keeping the Reserve Personnel Navy account funded at President's Budget levels enables the Reserve Force to generate warfighting readiness through trained Sailors who are ready to fight and win in the early stages of conflict and sustain combat operations following the outbreak of hostilities. Continued Congressional support will ensure that the Navy Reserve provides relevant, modern capability and capacity and a resilient surge force today, and into the next decade and beyond.

People

Future conflicts will demand a great deal from the men and women of the Navy Reserve. Our Sailors, Civilians and the families who support them collectively embody a Culture of Excellence that makes a formidable fighting force. To provide a ready, capable force, we owe our Sailors exceptional training, modern equipment, and a network of support that enables them to balance civilian jobs, military requirements, and family obligations.

Culture

Consistent with the Chief of Naval Operations' direction, the Navy Reserve continues to nurture a Culture of Excellence and to develop the resiliency of the force, while eliminating destructive behavior of all kinds. The warfighting readiness of the Navy Reserve depends on a diverse force with varying perspectives, united by a firm resolve to uphold our core values of honor, courage and commitment. Our organization has no tolerance for discrimination, extremism, or sexual assault and sexual harassment. Similarly, we are committed to the mental wellness of our Sailors and addressing the complicated and tragic issue of suicide.

DIVERSITY, EQUITY AND INCLUSION

The Navy Reserve is committed to cultivating diversity, equity and inclusion across the Force. This effort promotes organizational trust and transparency, and is a key factor in generating and maintaining warfighting readiness. To this end, the Navy Reserve played an active role in Task Force One Navy's efforts to identify and dismantle barriers to equality. We will continue to fortify a culture that values diversity and will inculcate the CNO's ten Signature Behaviors as a way of life for our Sailors and their families. These efforts leverage our differences and capitalize on individual strengths to create a cohesive and unified force where each Sailor's unique experiences, background and contributions are valued.

In alignment with the Secretary of Defense's direction, the Navy Reserve is also committed to eliminating extremism in the Force. Our policies prohibit Reserve Sailors from participating in organizations that advance supremacist, extremist or criminal gang doctrine, ideology and causes. This prohibition includes organizations that advocate illegal discrimination or encourage the use of force to deprive individuals of their civil rights. Leaders in the Navy Reserve are empowered with the full range of disciplinary authority, including administrative separation and criminal prosecution, to deal with Sailors who engage in extremist activities. We are also incorporating screening for these behaviors and ideologies as new Sailors apply to join

the Reserve Force. We value inclusion and will remove those individuals whose extreme views are contrary to the law or our standards of conduct.

SAILOR WELLNESS

Each Sailor, Civilian and family member is invaluable to our warfighting force, and we are dedicated to ensuring their wellness. The 21st Century Sailor office provides the policy guidance for the support network, programs, resources, training, and skills needed for our Sailors and families, both active and reserve, to overcome adversity and thrive. Tailored to our deploying and returning Sailors, the Yellow Ribbon Reintegration Program provides preemptive services, such as Returning Warrior Workshops, Deployment Readiness Training, and Deployment Health Assessments to address challenges facing Reserve Sailors and their families while serving the nation. We also provide the Psychological Health Outreach Program (PHOP) as a resource to enhance the resiliency of our Reserve Sailors. PHOP counselors and coordinators provide Resiliency Check-In events to new Sailors and Commands, enabling one-on-one mental wellness assessments and electronic behavioral health screening for immediate access to services.

In addition to programs that promote Sailor well-being, we provide safety nets for those Sailors who are struggling with depression or post-traumatic stress, and who may be at risk for suicide. To prevent such tragedy, we provide easily accessible resiliency-building resources, promote seeking support as a sign of strength, and encourage the connectedness of our people. Sailor Assistance and Intercept for Life, an evidence-based suicide prevention program, provides rapid assistance, ongoing risk assessment, and care coordination and reintegration assistance for activated Reserve Sailors who have demonstrated suicide related behavior. The prevention of suicide is an “all hands on deck” effort.

ELIMINATING SEXUAL ASSAULT AND SEXUAL HARASSMENT

All members of our team perform at their best when the prevailing culture is one of inclusion, diversity, and respect. Conduct contrary to these values undermines our readiness and impacts our ability to execute warfighting missions. Sexual assault and sexual harassment are crimes that must be eliminated. We are breaking down the barriers that lead to non-reporting, and training all Sailors on the programs available to assist them in addressing sexual assault and sexual harassment. The Sexual Assault Prevention and Response program is an integral piece of our concerted effort to eliminate sexual crimes in the Force. Leaders at every level are responsible and accountable for the culture of their command and our resolve to eliminate sexual assault is focused and indefatigable.

Supporting Our Sailors

Just as our Sailors cannot thrive without a positive culture, they would be hamstrung without practical policies and processes that enable their service. To that end, we are streamlining pay and personnel processes that govern how we bring Reserve Sailors onto active duty and how they are paid. Duty status reform, incentive pay and bonuses, and the Navy Personnel and Pay (NP2) system are the practical means that retain the best Sailors and help forge an effective warfighting force.

DUTY STATUS REFORM

For the past 25 years, efforts to reform the complex system of RC duty statuses have garnered attention without closure. Recently, in response to urgent tasking to combat the Coronavirus pandemic, we placed Navy Reserve Sailors in important roles, but in a variety of dissimilar order types. The varied benefits associated with myriad duty statuses makes it possible for us to compensate Sailors differently, and to provide dissimilar protections, for equivalent work—a situation that highlights the need for reform, simplification and standardization. The Navy Reserve supports the Department of Defense’s efforts to consolidate and simplify the approximately 30 existing Reserve duty status legal authorities. This consolidation will address imbalances and disruptions in pay and benefits, reduce overall complexity, and ensure programming and budgeting processes align to the categories, purposes, and duration of the orders.

NAVY RESERVE SPECIAL AND INCENTIVE PAY AND BONUSES

The Navy Reserve must recruit and retain Sailors with the skills required to compete and win in today’s challenging security environment. Recognizing that many of our Sailors’ specialized skills are highly sought after in the civilian marketplace, we provide special and incentive pay and bonuses to attract Sailors in hard-to-fill specialties. The current bonus structure for Reserve incentive programs is critical

to mitigating manning shortfalls in specific, high-demand skills and paygrades. Sustained Congressional support of predictable, critical RPN funding is necessary to ensure the Navy Reserve can attract and deliver the talent we need to prevail in a modern conflict.

NAVY PERSONNEL AND PAY

Pay problems, largely caused by antiquated pay systems, continue to challenge and frustrate our Reserve Sailors and their families. An integral component of the MyNavy HR Transformation, the Navy Personnel and Pay (NP2) system offers a modernized pay system that will enhance the quality of life for our citizen-Sailors while serving our nation. NP2 will integrate active and reserve component personnel and pay systems into a single Navy system. Specifically, in 2022, NP2 will achieve Initial Operating Capability for Treasury Direct Disbursement, with continued development of Personnel products and capabilities to achieve Full Operating Capability. The resulting changes will enable Reserve Sailors to seamlessly transition on and off active duty, without a disruption in pay. A seamless transition to active duty provides the efficiency necessary to mobilize large numbers of Sailors in a short time, as may be anticipated when surging forces to confront a near-peer rival. Similarly, this system will enable seamless demobilization processing without the burdensome, manual pay processes that characterize today's workflow.

Training the Warfighter

Changing global dynamics and growing rivalries with authoritarian states demand a renewed focus on maritime tactics, techniques and procedures. With an inclusive culture and supporting systems as a foundation, we will emphasize training our Sailors to develop the critical warfighting skills required to prevail in high-end conflict. We are assessing and updating policies to focus our Sailors on training for their mobilization billets, while reducing land-based individual augmentations and distracting administrative commitments unrelated to the Navy Reserve's traditional maritime role.

MOBILIZATION TO BILLET

Following the tragic events of September 11, 2001, the Navy began augmenting the Joint Force with Sailors who deployed as Joint Individual Augments (IAs) to alleviate land forces' high operational tempo during Operation Enduring Freedom and Operation Iraqi Freedom. Initially, the Navy sourced IAs from both the active and reserve components equally based on mission suitability. Over time, however, the reserve component assumed the majority of IA mobilizations. Specifically, in the last three years (FY18, 19 and 20), the RC sourced over 76% of the Navy's IA requirements, many outside the maritime domain. During this same period, the Navy Reserve has adhered to the Department of Defense's mobilization to dwell ratio policy. Under this policy, following a one year deployment, each Sailor requires Secretary of Defense approval to deploy with their unit if less than four years from the previous mobilization period, resulting in a loss of strategic depth and reduction in the capability and readiness of their unit. At present, with 9% of the force mobilized on IA missions and 18% sequestered in dwell, 27% of the Force is effectively fenced from surge mobilization as a result of IA demand. Eliminating involuntary, non-maritime individual augmentation requirements will restore strategic depth, and more effectively focus the Reserve Force on critical naval roles at sea and ashore.

Future conflict with our maritime rivals may come with minimal advanced warning, leaving little time to prepare. Our renewed focus on potential maritime conflict recognizes that a rapid response requires Selected Reserve Sailors to be trained and proficient in the functions and tasks associated with their programmed wartime billets. This mobilization-to-billet concept demands all Selected Reserve personnel train to the requirements of their warfighting role, ready to contribute to the fight in the earliest stages of conflict. Under a train-mobilize-deploy model, Reserve units will mobilize and deploy together as a unit, rather than individually, to conduct the warfighting missions they will have trained in advance to perform.

Capability and Capacity

To confront near-peer maritime rivals, the Navy Reserve will adapt its Fleet Design to provide the Navy with a cost-effective, sustainable, warfighting and surge-ready Total Force, structured to prevail in future competition and conflict. A critical aspect of this transformation is modernization of legacy platforms, systems, and equipment to ensure alignment with the latest Navy, Marine Corps, and Coast Guard operating concepts. The future fight may also require the strategic depth provided by our Individual Ready Reserve (IRR), and as such, we are updating our policies, systems, and processes to enhance IRR accessibility and effectiveness.

Future Fleet Design

The Navy Reserve is optimizing its force structure to develop warfighting capabilities that generate the strategic depth required for long-term strategic competition. My Fighting Instructions directed Reserve leaders, in close coordination with their active component counterparts, to assess the requirement for additional Reserve capability or capacity to address future challenges. For example, increasing complexity and the prospect of global conflict will require Fleet commanders to provide command and control of a large number of distributed Navy and Joint forces. Innovative Navy operating concepts call for distributed operations in contested environments, presenting logistics and communications challenges where peacetime solutions that leverage civilian supply chains and communications infrastructure may prove unreliable. Manning shortfalls in critical areas in the active component, combined with an intractable maintenance backlog, may challenge the Navy's ability to surge fleet forces in response to a crisis. The contest in the space and cyber domains and a greater leveraging of unmanned systems are transforming the nature of modern warfare, requiring specialized knowledge and skills. We will base decisions to place such capabilities or capacities in the reserve component on the Reserve Force's ability to deliver these capabilities at a reduced cost, within acceptable risk, relative to the active component.

Equipment Modernization

The Tri-Service Maritime Strategy and CNO's NAVPLAN mandate that the Navy Reserve keep pace with our active duty counterparts to provide seamless integration with the force. We are actively pursuing modernization of the Reserve Force to ensure interoperability between active and reserve platforms and systems, and divesting legacy systems that have exceeded their useful life. Last year's purchase of Reserve P-8 aircraft to recapitalize two aging—but highly operational—P-3C squadrons was a significant step forward in this endeavor.

NAVY UNIQUE FLEET ESSENTIAL AIRLIFT

Since World War II, the Navy has relied on aviation combat logistics to enable the expeditionary requirements associated with global naval operations. Operated entirely by the Navy Reserve, Navy Unique Fleet Essential Airlift consists of 30 C/KC-130T and 17 C-40A aircraft that provide the Navy's sole source of organic intra-theater air logistics. These platforms are capable of providing oversized cargo (F-35 engines, AMRAAM and Harpoon missiles, submarine masts, etc.) to forward-deployed and expeditionary Naval Forces, a critical link in the warfighting supply chain. Last year, fleet logistics (VR) squadrons flew 22,707 flight hours and transported 111,625 passengers and 22.2 million pounds of cargo for the Navy and the Department of Defense. Executing these missions generated a cost avoidance of nearly \$1.0 billion per year relative to alternative means of transportation.

At the height of the COVID-19 pandemic, Navy Reserve VR squadrons ensured the continuity of Navy training pipelines, safely flying Sailors between training sites when commercial options were reduced or unavailable. Supporting global operations, VR squadrons also transported personnel between U.S. overseas bases around the world. Specifically, C-130 missions increased 7.5% (from 817 missions to 878), while flight hours increased 16.6% (from 7,922 to 9,235 hours). Even with the increased execution of flight hours and missions, demand continues to increase for C-130 lift, with unmet lift requests reflecting a gap between demand and capacity. To date, FY21 indicates an even greater demand for cargo this year than in FY19 and FY20.

Procurement of the KC-130J to replace the legacy C/KC-130T is the Navy Reserve's top equipment priority. Transitioning from legacy airframes to the modern KC-130J aircraft is necessary to fill critical capability and capacity gaps and ensure interoperability with our active and reserve component Marine Corps and Air Force partners, who have already transitioned to the KC-130J. Every mission capable aircraft generates an average of \$48.6 million in cost avoidance for the transport of equipment. The current Mission Capable rates of the C/KC-130T average 25% of Total Aircraft Inventory, and required modifications of that legacy airframe will limit aircraft availability to a maximum of 33% until 2030. Comparatively, we expect to realize a 70% mission capable rate for the KC-130J which will provide an additional \$200 million per year in transportation and cost savings to the Navy. The current C/KC-130T fleet struggles to meet current fleet demand and lacks the required capability and capacity to meet wartime intra-theater logistics requirements, a situation best remedied through recapitalization.

AVIATION ADVERSARY TRAINING

The Reserve Tactical Support Wing (TSW) maintains 31 F-5N/F aircraft to provide low-to-mid level threat replication. These aircraft are split between two squadrons: VFC-111 at Naval Air Station (NAS) Key West, Florida, and VFC-13 at NAS Fallon, Nevada. In order to increase Adversary capacity, the Navy purchased 11 F-5E/F aircraft from Switzerland in FY20. Prior to delivery, these aircraft will receive modern avionics and an airframe reconfiguration to match the current active Navy airframe configuration. These 11 aircraft will deliver to TSW squadrons from 2022–2025 as F-5N+/F+, increasing both capacity and capability.

TSW currently provides critical high-end Adversary support to the Fleet with 27 F/A18A–D aircraft assigned to VFA-204 at NAS Joint Reserve Base New Orleans, Louisiana, and VFC-12 at NAS Oceana, Virginia. Due to the extremely high projected cost per flight hour (+\$44,000) of these “Legacy Hornets,” the Navy is accelerating divestment from the F/A-18A–D aircraft. VFC-12’s transition from the F/A-18A–D Hornet to the Block I FA-18E/F Super Hornet in FY21 is the first step towards accelerating Legacy Hornet divestment. Because there is an insufficient quantity of F/A-18E/F Super Hornet aircraft to recapitalize the entire F/A-18A–D fleet assigned to TSW, a plan has been proposed to replace the F/A-18C with F-16 aircraft from the United States Air Force and Air National Guard. Providing the Fleet with advanced, high-fidelity Adversary support will require future funding to further modernize these aircraft with threat representative capabilities such as Infrared Search and Track Systems and the evolution of the Adversary data link known as RedNet.

Within the next decade, 62% of the Navy Reserve’s current Adversary aircraft will be retired due to the high cost of each service hour, or because they have reached the end of their service life. Recapitalization and expansion of Adversary capacity in the Navy Reserve presents a cost-effective, sustainable solution to develop warfighting readiness. In FY20, active component Strike Fighter squadrons flew 13,129 hours of Adversary support, generating more than half of the total Navy Adversary hours while adding costly flight hours on inventory-limited fleet aircraft. Flying more Adversary hours in the Reserve increases service life of those active Fleet Strike Fighter aircraft and at the same time reduces overhead operational costs. As such, increasing Navy Reserve support to Navy Adversary requirements will improve active component Strike Fighter service life, while enabling the dedication of Fleet flight hours to train for warfighting readiness.

Warfighting Capacity: Individual Ready Reserve Management

A highly trained, well-designed Selected Reserve with the latest equipment may still be insufficient to confront our maritime rivals. In global conflict, the Navy will require ready access to the additional capacity and talent resident in the Individual Ready Reserve (IRR). The Navy’s IRR consists of 41,000 trained Sailors with previous service in the active component or Selected Reserve, now serving in a non-pay, non-participation status. IRR Sailors have residual military service obligations and are available for Selected Reserve accessions, as well as mobilization to support Navy and Joint operations. The emergence of COVID-19 provided an opportunity to re-imagine how we employ the IRR, prioritize and facilitate participation, and examine our abilities to leverage resident skills to meet warfighting requirements. In alignment with Navy Reserve Force initiatives and the Chief of Naval Personnel, we are exploring programmatic changes that enable proactive management of the IRR to improve readiness and reconstitute the strategic depth of the Total Force.

Mobilization Infrastructure and Technology

A growing rivalry with near-peer maritime competitors demands the capability to rapidly surge forces for conflict. The Navy Reserve is adapting our mobilization processes and leveraging Information Technology to meet this demand.

Total Force Mobilization

The Navy Reserve is transitioning from a mobilization process tailored to meet Joint IA demands associated with the global war on terrorism, to one that accelerates access to the reserve component by providing greater throughput suitable for the demands of an evolving security environment. This new process, known as Adaptive Mobilization, requires achieving efficiencies in Full Time Support (FTS) manpower across geographically distributed mobilization centers. Realignment of selected Navy Operational Support Centers (NOSCs), and the Sailors who staff them, is necessary to realize this efficiency.

ADAPTIVE MOBILIZATION

Surging to respond to the COVID-19 pandemic, the Navy Reserve first operationalized the Adaptive Mobilization concept in the face of real-world urgent demands. Nearly 1,000 Sailors mobilized through their local Navy Reserve Activity rather than through a single, centralized processing site as Sailors had done for the last decade. This change eliminates the bottleneck associated with the legacy process and promises strategically significant improvements in accessing the force in large-scale global conflict.

NAVY OPERATIONAL SUPPORT CENTER REALIGNMENT

The Navy Reserve maintains at least one Navy Operational Support Center (NOSC) in each of the 50 states and two US territories. This presence has historically provided Navy representation in communities far from fleet concentration areas. To achieve the accessibility improvements promised by Adaptive Mobilization, however, the current infrastructure profile requires realignment. A rigorous review of all 122 NOSCs identified opportunities for consolidation to reapply FTS manpower for the Adaptive Mobilization model. Closure decisions will be based on criteria that includes the presence of other NOSCs in close proximity, whether the center is on a military facility, changes in the local Selected Reserve population, the age of the facilities, and operating and repair costs. Should any NOSC be identified for consolidation, we will redistribute the FTS staff to support implementation of the Adaptive Mobilization model across the force.

These changes will significantly accelerate our ability to surge Sailors to the fight and meet warfighting requirements. Further, they simultaneously reduce sustained force protection risk, administrative redundancies, and operating and maintenance costs. Additionally, consolidation will mitigate the inherent risk to aging infrastructure from forces such as climate change. For example, in FY21, we spent \$600,000 for hurricane damage and repairs, and there are repairs remaining from the FY21 Texas freeze and other hurricane disasters. Closing a select few NOSCs will capture cost savings, reduce redundancy, divest aging infrastructure, and allow strategic investment in the redistribution of Full Time Support manpower to support Adaptive Mobilization processes. NOSC realignment will better position the Navy Reserve to adapt to meet the changing needs of the global security environment.

Information Technology

The Navy Reserve leverages information technology (IT) capabilities to enable the training and readiness of a geographically distributed force and has begun to employ data analytics to achieve greater efficiencies for force mobilization.

CLOUD COMPUTING, MOBILITY INNOVATIONS AND DIGITAL CAPABILITIES

The Navy Reserve's strategy for information technology provides approximately 59,000 geographically dispersed Ready Reservists world-wide access to critical IT business systems. The strategy emphasizes improving efficiency and lethality through three core technological advances: Cloud Computing, Mobility Innovations and Digital Capabilities. Secure mobile applications, innovative technological solutions that simplify processes, and the use of data science to inform strategic decisions are force enablers that keep the Reserve Force operating in a technologically advanced battle space. During the peak of the COVID-19 pandemic, the Navy Reserve seamlessly continued mobilization and warfighting readiness and training requirements as well as steady operational support due to IT capabilities on par with commercially available technology.

NON-DEPLOYABILITY ANALYTICS

The Navy Reserve is maturing its data analytics capability to reap the benefits of advances in data science and emerging technologies such as Artificial Intelligence and Machine Learning (AI/ML). Navy Reserve Sailors must meet deployability standards to be eligible for mobilization to the battlefield. Using AI/ML, we have developed an application that accurately predicts those Reserve members at highest risk for mobilization cancellation. More importantly, the Mobilization Assurance and Assistance Program for SELRES (known as MAAPS) identifies unique factors for each Reservist in much the same manner as a "FICO score," allowing leadership to tailor interventions to their particular challenges, thus increasing the overall deployability of the Force.

CONCLUSION

The Navy, Marine Corps, and Coast Guard are urgently adapting to provide Integrated All-Domain Naval Power to address the reemergence of maritime rivals. Similarly, the Navy Reserve has prioritized warfighting readiness to provide a surge-ready Total Force capable of defending the nation, as we have done for more than a century. The Navy Reserve is committed to forging our Sailors into an effective maritime warfighting force, underpinned by a strong cultural foundation, shared values, and tactical proficiency. A future fleet designed around capabilities that provide a decisive advantage, enabled by modern platforms and hardware, will ensure the Total Force prevails in competition or conflict. Greater efficiencies realized through advances in our mobilization infrastructure and information technology will provide the ability to deploy war-winning forces rapidly to the conflict theater. These enhancements to the generation of the Navy Reserve's warfighting readiness support the strategic direction reflected in the National Defense Strategy and current service doctrine, and will contribute to prevailing in conflict if necessary.

On behalf of the men and women of the United States Navy Reserve, thank you for your steadfast support of Navy Reserve Sailors, Civilians, families, and employers. The Navy Reserve enjoys a 106 year history of facing and overcoming challenges. Beginning with our founding in 1915, anticipating the emerging global insecurity of the First World War, adapting to the capability, capacity, and scale required by the Second World War, evolving during the long phases of the Cold War and into the Global War on Terror, our Navy Reserve has adapted in each era to answer the emerging challenges of national security. Today, we have entered a new era with new challenges. With your continued support, we will lead the adaptation of our Navy Reserve to address the current and future global environment with speed and agility.

Senator TESTER. Thank you, Admiral Mustin.

Next, we have Lieutenant General Richard Scobee, the Air Force Reserve.

**STATEMENT OF LIEUTENANT GENERAL RICHARD W. SCOBEE, CHIEF,
U.S. AIR FORCE RESERVE**

General SCOBEE. Hello, Chairman Tester, Ranking Member Shelby, and Distinguished Members of the Subcommittee.

It's an honor for me to be here today with my other service counterparts, and it's also an honor for me to represent the airmen of the Air Force Reserve.

I would normally be joined today by my senior enlisted advisor, Chief Master Sergeant Tim White, but he is supporting the Chief Master Sergeant of the Air Force and the Chief Master Sergeant of the Space Force at their Quality of Life Hearing with the House.

As a command team, the Command Chief and I are continually amazed at the accomplishments of our Air Force Reserve citizen airmen, despite every challenge that has been put in front of them over the past year.

The Air Force Reserve is a cost-effective, accessible, and ready force. We provide strategic depth with rapid surge capability across every Air Force core mission set. We do so cost effectively because we are predominantly a part-time force and we are an accessible force, contributing globally to Joint Force operations every day, and, finally, we are a ready force.

When the Nation needed rapid pandemic response, we had medical personnel on the ground in New York City and New Jersey within 48 hours of being notified. We provide strategic depth for national defense while operating on only 3 percent of the Air Force budget.

We're committed to attracting top talent and fostering a culture of inclusion where every airman is valued and can thrive.

With Congress's assistance, we preserve pre-pandemic gains in both individual and unit level readiness and through things like force innovations, such as virtual training. We modernize key weapon systems and lessen critical manpower shortfalls. We increased our organizational effectiveness and enhanced our ability to provide excellent care for citizen airmen and their families through internal reforms and process improvements.

The Air Force Reserve invests every congressionally-enacted dollar for maximum return. We are grateful for the \$19.5 million we received in CARES (Coronavirus Aid, Relief, and Economic Security) Act funding, which allowed us to rapidly scale our telework capability to protect our workforce during the pandemic.

We are also grateful for continued direct hire authority for critical career fields. Last year with this authority, we significantly increased our Air Reserve technician pilot manning from where it was at 75 percent the last time we talked to 97 percent today.

Our requested fiscal year 2022 budget will ensure the Air Force Reserve meets national defense strategy objectives and the multi-domain force that we need.

We are in step with the Chief of Staff of the Air Force's vision to accelerate change or lose. We are able to compete with our nation's adversaries across the spectrum of conflict and will continue to do that by capitalizing on our readiness gains we made last year.

We diligently request only those funds we can execute, the Reserve personnel appropriations and operation, and maintenance funds which drive our readiness. These accounts fund our training, our flying hours, mobilization requirements, our equipment maintenance, and our salaries.

In particular, our flying hour and civilian pay programs have taken considerable reductions in recent years, rightfully so, due to insufficient justification and an overestimation of funds that we needed.

We've made significant internal strides in adjusting these accounts, and I look forward to working with you to enhance readiness and reduce risk in our fiscal year 2022 budget.

I also want to thank you for enabling access to Tricare Reserve Select. We are all on this panel in agreement that this major legislative accomplishment will offer affordable continuity of care for our members and their families.

However, the legislative currently doesn't take effect until 2030. To improve our Reserve force's quality of life and readiness, I request your support for accelerated implementation and funding of this healthcare access.

One final area I would like to touch on is equipment parity. We accomplish this primarily through the National Guard and Reserve Equipment Appropriation. NGREA enables us to modernize equipment, sustain our capability, and replace obsolete equipment to maintain parity with the Active component when recapitalization is not feasible.

Parity is critical to seamless total force integration and we remain grateful for these appropriations and cannot overemphasize how vital they are to our readiness. I appreciate your support for NGREA now and in the future.

Thank you for the opportunity to be here before you today and for your steadfast support as we ensure the Air Force Reserve remains prepared to defend our great Nation and the American people. I look forward to answering your questions.
[The statement follows:]

PREPARED STATEMENT OF LIEUTENANT GENERAL RICHARD W. SCOBEE

As an integral component of the Total Force, the Air Force Reserve provides experienced manpower and critical capabilities for our National Defense. Our Citizen Airmen are interchangeable, interoperable, and integrated across the Total Force. We execute the full spectrum of Department of the Air Force missions, while providing daily operations at a fraction of the cost of a standing force.

Total Force operations require Total Force readiness. The Air Force Reserve must be structured, trained, and equipped for the future fight. Operational success in tomorrow's battlespace requires an agile, modern force. We must be prepared to provide ready forces for joint operations, defend our homeland, counter violent extremist organizations and rogue nations, and deter aggression through nuclear and conventional readiness.

Because of the hard work and support of Congress, we were able to make steady gains in readiness during Fiscal Years (FY) 2018 and 2019 and preserve those gains in FY 2020. Funding from the Coronavirus Aid, Relief, and Economic Security (CARES) Act was integral in our efforts to maintain readiness during the pandemic. With nearly \$19.5 million in additional funding, we were able to invest in needed software and information technology infrastructure, allowing us to preserve our force and provide virtual training. With this investment, we scaled from an average of less than 1,000 remote workers to supporting nearly 15,000 across the Total Force. Passing legislative relief to allow Reservists to complete a qualifying year for retirement if the COVID-19 pandemic prevented them from doing so, has the potential to be extremely beneficial by preventing career disruption.

With the assistance of Congress, we have preserved both individual and unit level readiness across the Air Force Reserve. Our nuclear deterrence forces are mission ready, and we increased our priority unit readiness. We modernized key weapon systems and lessened critical manpower shortfalls. Through internal reforms and process improvement initiatives, we increased our organizational effectiveness and enhanced our ability to provide excellent care for our Citizen Airmen and their families.

While we continue to preserve our force and readiness, we still face challenges. Due to limited resources, the Air Force Reserve will continue to balance requirements and prioritize critical system upgrades to our aircraft to enhance our ability to provide relevant warfighting capacity to the Total Force in order to enable joint all-domain operations. Additionally, we will begin to prioritize backlogged infrastructure and facilities requirements within our existing resources to optimize our training.

The Nation's adversaries have studied our vulnerabilities and employed technological advances to exploit them, thereby eroding our longstanding advantages, altering the nature of warfare, and expanding conflict into new domains. The changing battlespace has given rise to new operational missions and generated a need for advanced capabilities.

In his paper, Accelerate Change or Lose, the Chief of Staff of the Air Force presented a clear case for the changes needed to ensure we are able to meet the challenges of the security environment. Accelerate Change or Lose outlines a path toward ensuring the Total Force is ready when called to defend our Nation and its interests. Because we are involved in every core Air Force mission set, nearly every Active Component initiative impacts the Air Force Reserve. To remain relevant contributors to joint operations, we must maintain interoperability as a Total Force. We optimize our operational capability when we maintain parity with our Active Component counterparts. The concurrent fielding, recapitalization, and divestment of airframes, systems, and equipment is essential to the Air Force Reserve's ability to more effectively integrate within the Total Force. Associations between geographically co-located Active and Reserve component units greatly enhances this integration, providing multiple benefits to the Total Force at the best value for the American taxpayer.

Our readiness, operational capabilities, and success as an organization all depend on our Reserve Citizen Airmen. They are both the heart of our organization and its foundation. Our Reservists are incredibly talented. Their diversity and high level of experience multiplies our operational capabilities, and their dedication enables exe-

cution of our mission. It is therefore incumbent upon us to develop our Airmen as individuals, technical experts, and leaders, ensuring they have the resources and support they require. We are absolutely committed to providing excellent care to our Citizen Airmen and their families.

The Air Force Reserve is a cost effective force, and will continue its excellent stewardship of American taxpayers' dollars.

THE AIR FORCE RESERVE IN THE TOTAL FORCE

The Air Force Reserve is a predominantly part time force which, when mobilized, provides full time support to the Joint Force. In addition to our daily contributions to global operations, we provide rapid surge capability and strategic depth for national defense. We participate in almost every Active Component mission, operating as part of an integrated Total Force across nearly all Air Force core functional areas and weapon systems.

On average, over 6,000 Reserve Citizen Airmen contribute to world-wide operations every day. Typically, approximately two thirds of those Airmen are volunteers. Our personnel support all combatant commands and are deployed to every geographic area of responsibility. Last year, approximately 5,500 Airmen mobilized or volunteered to support operations in response to the COVID-19 pandemic. Within 48 hours of a request for forces, we were able to generate airlift to ensure that 120 medics were in place in the New York City metropolitan area. In total, 274 medical personnel were deployed to the northeastern United States in support of the national COVID-19 response, representing the largest unplanned mobilization of Reserve forces since 9/11. Last year, our Reservists provided nearly two million days of support to the Active Component and the Joint Force.

In addition to supporting global military operations, the Air Force Reserve partners with and supports multiple federal and civil organizations and institutions. We routinely participate in humanitarian aid and disaster relief efforts. We also support global scientific research programs in addition to education and technology initiatives. This year, we added new winter weather reconnaissance capabilities to collect data on Atmospheric Rivers on the West Coast, supporting the National Oceanic and Atmospheric Administration (NOAA) in forecasting floods. We also flew 164 missions to cover 20 of 30 named storms.

In 2020, the nearly 4,000 Reservists supported 91 service, joint, and multinational exercises, increasing Joint Force integration and strengthening relationships with allies and partner nations. The COVID-19 pandemic increased exercise participation manpower costs, as restriction of movement measures mandated significant personnel isolation before and after exercises. The pandemic also resulted in 53 planned exercises being cancelled. This resulted in nearly 4,000 Reservists missing an opportunity to receive readiness or proficiency training and approximately \$11 million in unobligated Reserve Personnel Appropriations.

Approximately 75 percent of Air Force Reserve members serve part time. In addition to their military training and experience, our part time force brings a wealth of knowledge and expertise from their civilian careers to their military service. This strengthens our capabilities, enables the integration of civil sector best practices, and facilitates beneficial partnerships with industry and other institutions. Many of our members have civilian careers similar to their military jobs, which enables Citizen Airmen to bring scope and depth to their military positions. This is particularly advantageous for emerging and evolving missions, such as cyber and space, into which we actively recruit personnel with civilian experience.

The Air Force Reserve provides the Total Force with a method to retain talent, by providing a continuity of service options for Active Component members who would otherwise separate. The Department of the Air Force understands the importance of retaining experience and talent, and seeks to leverage the value, which the Reserve Component brings to the Total Force. In addition to using Total Force partnerships to place newly trained members in units with highly experienced personnel, the Air Force is currently exploring flexible service options designed to allow members to easily transition between components of the Total Force. The Air Force Reserve fully supports these efforts, which will benefit our Airmen, our readiness, and our national defense.

Total Force Integration is exemplified by associations between geographically collocated Active Component and Reserve units. In this construct, equipment resources are officially assigned only to the lead unit, but are shared between the lead and associate unit. Associations further enhance our interoperability and give the Active Component access to the experience resident in the more seasoned Reserve force. This ensures parity in equipment and training, while providing cost savings and readiness benefits to both components.

Currently, there are 79 associations between the Reserve and the Active Component. Most of these are classic associations, in which the Active Component is the lead organization. Active associations, in which the Reserve is the lead unit, comprise a little more than twelve percent of current associations. The Reserve and the Active Component have associations in nearly every major mission set, and many training units, including every undergraduate pilot training wing, pilot instructor training, and major aircraft formal training units. We are also the lead component for the B-52 and C-5 Formal Training Units.

IMPLEMENTING THE NATIONAL DEFENSE STRATEGY

After nearly two decades of counter-terrorism operations, great power competition has re-emerged as the highest priority for national security. The rise of peer and near-peer competitors on the world stage in an age of unprecedented global economic interdependence, combined with the proliferation of swiftly advancing technology, has created a unique and complex environment. Accelerate Change or Lose affirms that a rapid shift in military operational focus and capabilities is imperative to remain competitive in this security environment. The United States must be able to combat adversaries across the spectrum of conflict and operate simultaneously in all warfighting domains. The 2018 National Defense Strategy provides the framework to ensure we can compete, deter, and win in tomorrow's battlespace, and we are diligently working to meet that intent.

Our efforts align under those of the Department of the Air Force and support the Total Force's mandate to provide ready forces for national defense. In order to operate seamlessly in a combat environment, we must have the capability to connect with the Joint Force. The Total Force must be capable of conducting robust nuclear and conventional deterrence, homeland defense, and counter-extremism operations. Meeting this mandate in the future operational environment will require the Total Force to dominate space, generate combat power, and conduct logistics under attack. As the Airmen who execute the mission represent the most important element in this and every undertaking, the Department of the Air Force is simultaneously focused on developing and caring for our people and their families.

Air Force Reserve Strategic Priorities

To restore readiness rapidly and prepare for the future fight, the Air Force Reserve established three priorities. The first, prioritizing strategic depth and accelerating readiness, focuses on the requirement to prepare for future operational requirements while maintaining present-day readiness. This includes sustaining our present level of support to the Joint Force. The second, developing resilient leaders, serves two purposes: to enhance the physical, mental, and emotional fitness of all Reserve Citizen Airmen and to develop mission-focused leaders who can operate independently. Our final priority, reform the organization, aims to increase efficiency and effectiveness through internal process improvements and innovation.

The Air Force Reserve strategic priorities were developed based on the challenges outlined in the National Defense Strategy and are aligned with Secretary of Defense, Secretary of the Air Force, and Chief of Staff of the Air Force directives. We made significant gains in 2020, preserving overall readiness, implementing new leadership development programs, and improving our internal operations. We are in the process of expanding and accelerating these efforts to further enhance our mission readiness and our ability to support Air Force Reserve Citizen Airmen and their families.

Air Force Reserve Future Force Framework

Both the Future of Defense Task Force Report 2020 and Accelerate Change or Lose acknowledge that our technological advantages are rapidly eroding in a strategic environment that is defined by great power competition. Both of these documents call for change to meet the requirements of the National Defense Strategy. To align Air Force Reserve capabilities and force structure with the National Defense Strategy and to posture our force to execute tomorrow's missions, we developed the Air Force Reserve Future Force Framework. This will enable us to deliberately organize, train, and equip our force to best prepare for conflict in highly contested environments. This framework directs mission optimization through assessing capabilities to determine which mission sets are best suited for the Air Force Reserve to align and improve policy, planning and programming efforts. The framework also provides for tailored and prioritized training. This element synchronizes training efforts and capitalizes on technology to optimize unit training assemblies by enabling the completion of ancillary training requirements through virtual methods. Finally, the Air Force Reserve will continue to leverage civilian sector strengths

by capitalizing on member expertise and knowledge, cultivating industry partnerships, and tailoring recruitment efforts to develop the force of the future.

INFRASTRUCTURE AND FACILITIES

Maintaining and modernizing our infrastructure and facilities is critical to readiness, force protection, and ensuring a safe work environment for our Airmen. These efforts are funded through Military Construction (MILCON) appropriations, which provide for new facilities and major infrastructure projects, and with the Facility Sustainment, Repair, and Modernization (FSRM) funds included in our O&M appropriation. FSRM appropriations are used to repair and modernize existing facilities and to extend the service life of existing infrastructure. Through the FY 2021 Consolidated Appropriations Act, Congress provided funds for the construction of a new F-35 simulator facility and squadron operations facility at Naval Air Station Joint Reserve Base Fort Worth, Texas.

GENERATING COMBAT POWER TODAY AND TOMORROW

The Air Force Reserve provides daily operational support to the Joint Force, while maintaining a strategic force for sustained operations during major conflict. We provide surge capacity and rapid response capabilities, enabling the Joint Force to quickly adapt to operations tempo increases and unforeseen events, such as national disasters and contingencies. We also fill Active Component manning shortfalls and provide augmentation to meet short term manpower requirements.

Our ability to meet current taskings and to supply strategic manpower are predicated on our readiness. As an operational reserve, we must maintain our readiness to support present-day missions while we align our capabilities to meet the intent of the National Defense Strategy and prepare for future requirements. Last year, we focused on preserving the readiness gains of the previous two years, concentrating efforts specifically on mission essential personnel preparing to deploy and entering training pipelines.

The Air Force Reserve must be able to decisively employ both traditional and emerging capabilities. In order to enhance our ability to compete, deter, and win in any environment, we remain focused on key mission sets and are actively expanding our capabilities in the space and cyber realms. As warfighting domains become increasingly integrated, we must be prepared to conduct joint all-domain operations, which will allow us to create decisive, asymmetrical advantages in future conflicts.

Nuclear Deterrence Operations

Nuclear capability is a foundational element of our national defense, and the Air Force Reserve shares in the nuclear mission. Our Nuclear Deterrence Operations assets include nuclear strike, air refueling, and command, control, and communications capabilities. In FY 2020, we supported one Nuclear Operational Readiness Inspection to assess the readiness of our forces to conduct Nuclear Deterrence Operations. Our nuclear forces remain mission ready.

Air Superiority

In order to defeat a peer or near-peer adversary, we must be able to generate combat power in contested environments. Maintaining parity with the Active Component is essential for assuring the ability to operate in contested environments. Program upgrade delays and limited delivery of replacement aircraft add risk to the ability to sustain air superiority strategic surge capacity in the future.

The Air Force Reserve has Classic Associations in several F-35 units. We execute F-35 combat operations in our association at Hill AFB, Utah. Additional associations execute F-35 formal training at Luke AFB, Arizona and Eglin AFB, Florida, and operational test and weapons instructor course missions at Nellis AFB, Nevada. The Air Force Reserve's first unit-equipped F-35 wing will execute combat operations and be part of an Active Association.

Aerial Refueling

The Air Force Reserve air refueling fleet in FY 2021 consists of seven unit equipped wings and four associate wings. In December 2019, our Unit Equipped wing at Seymour Johnson Air Force Base (AFB), North Carolina, began its KC-46 airframe conversion. Four of the twelve aircraft were delivered in FY 2020 with the remaining eight scheduled for delivery early in FY 2021. Half of the crews have already completed conversion training, along with 85 percent of maintenance personnel. The Classic Associate unit at McConnell AFB, Kansas entered conversion in April 2020 with 50 percent of both operations and maintenance personnel completing conversion training in 2020.

At present, we have eight wings which operate the KC-135, two of which are currently undergoing conversion to the KC-46. Six of these wings are unit-equipped, and three are tasked with an alert mission. We are focused on the readiness of our KC-135 force, with the goals of improving mission capable rates, increasing aircrew and maintenance manpower, and providing better training for our aircrew and maintenance personnel. The first Air Force Reserve aircraft began datalink modification with “Real Time Information in the Cockpit” (RTIC) in early 2021. This modification increases the communications and information capabilities of the aircraft increasing its support capacity in a fast paced contested environment.

The Air Force Reserve has two wings who associate with the Active Component to fly and maintain the KC-10. The Air Force Reserve remains committed to this aircraft and mission as long as it remains a part of the air refueling force. As the inventory is reduced, the Air Force Reserve will work with the Department of the Air Force to convert those units and their manpower to the determined follow-on missions.

Airlift

The Air Force Reserve enables combat delivery through our strategic and tactical airlift fleets. In order to effectuate the C-5 formal training requirements, the Air Force Reserve requires a ground training device to increase training efficiency and precluded the requirement for a dedicated flyable aircraft for ground training. The C-5 fleet continues to invest in programs to address safety, obsolescence, regulatory compliance, and long term sustainability. The C-130H fleet Aircraft Modification Program Increment 2 (AMP 2) contract award resulted in a savings of \$540 million across FY 2020–2024. The C-17 fleet continues to provide operational and strategic depth to the Global Reach enterprise.

Dominating Space

The establishment of the United States Space Force (USSF) in December 2019 underscored the importance of space to our national security. The Air Force Reserve is a major contributor to space operations. In the last year, our personnel executed up to 30 percent of daily space missions directly supporting United States Space Command taskings. We added 30 space manpower authorizations in FY 2021. In addition, the Air Force Reserve has already taken steps to provide focused support to the USSF for the near term. Our space units are aligned with and will be able to integrate effectively with USSF forces for the foreseeable future.

Cyber Defense

Digital technology permeates nearly every aspect of modern life. This technology is both pervasive and inexpensive, making the cyber domain easily accessible. The increasing integration of cyber capabilities enhances our ability to generate combat power, yet exposes us to new threats. Therefore, the Air Force Reserve is building and expanding our foundational capabilities to conduct operations in the information environment, by evolving our cyber mission portfolio and repurposing our cyber force to better defend against future threats.

We provide support directly to Air Forces Cyber, Sixteenth Air Force, and United States Cyber Command. We are implementing the Cyber Squadron Initiative and are developing Mission Defense Teams with three of ten teams projected to reach Initial Operational Capability declaration during FY 2021. These teams will be located at Air Force Reserve host installations, as well as Naval Air Station Joint Reserve Base Fort Worth, Texas where we are the lead Air Force unit.

We are in the process of transitioning our cyber personnel from information technology support to mission assurance and defensive cyber operations. Along with our Active Component counterparts, we are replacing our internal communications network with contractor delivered information services. The shift to Enterprise Information Technology as a service will allow us to leverage modern systems and practices from civilian industry for our internal networking needs, while enabling our personnel to focus on cyber operations and defense.

The Air Force Reserve is continuing to develop and implement new programs to expand accessibility and better utilize data. Our goal is to migrate from stove-piped service information technology systems to cloud based platforms. As part of this effort, we are transitioning to an operating-system agnostic framework. We are extending mobile-based capabilities and implementing alternative platforms to enable increased user accessibility. These efforts allow users to connect securely to Air Force networks through virtual desktop applications, enabling access from any device and any location. They also significantly reduce the equipment, software, and maintenance support requirements to maintain infrastructure. Our work in these areas prior to the pandemic allowed for our rapid scaling of telework initiatives. We

are working with the Air Force Chief Data Office to create a mature Shared Data Environment, which will serve as a single source for information.

Intelligence, Surveillance and Reconnaissance (ISR)

The Air Force Reserve ISR enterprise is uniquely designed to provide strategic depth and operational surge capacity in traditional and emerging mission sets. Tailoring mission profiles is necessary to ensure our ISR forces are readily available for mission execution. We will develop capabilities in areas that support the Joint Force while ensuring current mission sets are relevant to multi-domain operations and great power competition. Investments in the operational use of publicly available information, increased presence in battlespace characterization, and support to key capabilities—such as nuclear, space, and cyber operations—are necessary to ensure that we are postured to meet the needs of Joint Forces.

The Air Force Reserve continues to provide approximately 500 experienced pilots, sensor operators and intelligence Airmen to support Remotely Piloted Aircraft (RPA) operations at five associations with our counterparts in Air Combat Command and Air Force Special Operations Command. We will maintain our contribution of both steady state and surge capacity to MQ-9 combat lines, as the Total Force RPA enterprise reorganizes to a leaner and more lethal force.

Command and Control (C2)

The Air Force is preparing for the future fight by fielding new concepts and capabilities which enable Joint All-Domain Command and Control (JADC2), the Department of Defense's top modernization priority, which is critical to executing joint all-domain operations. JADC2 is a system that uses data, machine learning and state-of-the-art software to seamlessly link "sensors to shooters" and create a resilient, adaptable line of communications across all domains—air, land, sea, cyber and space to faster and more accurate enable decision making. The Air Force Reserve's current C2 program will continue to provide strategic depth for the Total Force as the Air Force pursues the development of JADC2.

As part of the Air Force's strategic initiative to strengthen joint leaders and teams, Fifteenth Air Force will now provide the Department of Defense with an air-centric capability to task during crisis operations and be offered as part of the dynamic force employment model to meet the National Defense Strategy for more integrated and multi-domain operations. Our FY 2021 budget allocated 60 Air Force Reserve positions to stand up a classic associate unit for the service-retained, Joint Task Force (JTF)-capable organization at Fifteenth Air Force, JTF Headquarters at Shaw AFB, South Carolina. This classic associate unit is projected to reach Initial Operational Capability during 2021.

MANNING A READY FORCE

Adequate manpower is vital to readiness. For several years, our overall manpower has hovered slightly below end strength targets. During the pandemic, the Active Component experienced high retention rates, which impacts our ability to recruit prior service Airmen. While we do have part time manning shortfalls in some locations and in certain critical career fields, our total assigned part time personnel is near the total authorized. Although there have been improvements in the past year, our full time assigned manning remains below the authorized level.

Our full time personnel continue to preserve our readiness while maintaining a high operational tempo. However, our full time force is overtasked. We place too many requirements on too few Airmen. We owe it to them to reduce some of the burden.

Our full time force is a mix of Air Reserve Technicians (ART) and Active Guard Reserve (AGR). Between 2013 and 2018, our ART manning levels dropped from 80 to 74 percent, largely due to the highly competitive civilian job market. This decrease in positions filled was further exacerbated by the civil service hiring process, which prolonged vacancies and caused us to lose candidates.

Ensuring our full time personnel are fairly compensated for their work is essential to recruiting and retaining talented individuals. Therefore, we implemented several initiatives to fill our full time manpower positions. These efforts are producing results. At the start of FY 2019, our full time manning level was approximately 75 percent. By the end of the first quarter of FY 2021, the number of assigned ARTs increased to 82 percent of authorized.

The increase in our assigned full time manning levels is due, in part, to the conversion of a percentage of our ART billets to AGR authorizations. AGR manpower and retention rates are higher than that of the ART force, with a comparatively faster hiring process. Please also note, younger workforce members often have difficulty demonstrating the qualifications required to be listed on a hiring certification

for ART positions. AGR positions, with an effective off ramp strategy, can provide a way to gain sufficient experience to be considered for ART positions at the end of a three year AGR tour. The ART to AGR conversion initiative is a multi-year effort, which began in FY 2018. In FY 2020, we executed 521 conversions, and we are rapidly progressing on our remaining 816 conversions planned for FY 2021.

Our ART manning and overall full time manpower also benefited from Direct Hiring Authority. This authority, which Congress granted, streamlines the civil service hiring process for certain critical career fields, drastically decreasing hiring timelines. Direct Hiring Authority provided particular benefit to our full time maintenance force. This authority allowed us to hire 1,166 ARTs and civilians, increasing full time maintenance manpower to 80 percent. Direct Hiring Authority enabled us to decrease our ART maintainer vacancies to their lowest level in nearly five years.

Extending this authority to pilots has produced similar results. In FY 2020, our full time pilot manpower was nearly 75 percent of authorized. Last year, Direct Hiring Authority was used for 55 percent of pilot hiring, helping us achieve a full time manning level of 97 percent of authorized. Overall, pilot manpower has remained steady over the last year, at above 85 percent. We are exploring new options to increase both full time and part time pilot manning, including updating pay grade determination criteria for ART aircrew members and offering additional civilian recruitment and retention incentives.

We are grateful to Congress for authorizing Tricare Reserve Select (TRS) for military technicians and other Title 5 civilians who also serve in a Reserve Component. When enacted in 2030, this will serve as a significant retention tool, as it provides Reserve Component members a cost effective option for obtaining premium healthcare for themselves and their families.

In addition, the Air Force Reserve took steps to improve retention in both our full time and part time force. Reducing attrition preserves readiness and provides cost savings by decreasing training requirements. We are presently targeting retention through bonuses and special salary rates, which offer a marked return on investment. A single \$15,000 retention bonus results in a cost avoidance of roughly \$45,000 in training funds and prevents an approximately three year readiness gap, which occurs while a replacement is trained.

While we have experienced a two year positive trend in increasing retention, we are continuing to focus our retention efforts on Airmen with six to ten years total service, which is the group with the highest attrition rate. In addition to expanding existing programs, we are seeking new methods of increasing retention and engaging wing leaders in these efforts. We also reduced barriers to recruiting, including decreasing hiring timelines, eliminating mileage restrictions, and removing unnecessary interview requirements. In FY 2020, our attrition rates were 10.3 percent, below the goal of 10.9 percent. To date, our FY 2021 attrition rates are at 10 percent with a goal of staying below 10.5 percent.

Our full time to part time force mix is based on pre-Gulf War force structure and operational tempo. In order to effectively accomplish our mission, train our force, and maintain readiness, we must increase the percentage of full time manpower in relation to our end strength. Presently, full time uniformed military members constitute approximately 25 percent of Air Force Reserve authorizations. Based on current requirements, we need to continue our efforts to increase this type of full time support which is essential to maintaining readiness.

MODERNIZING AND IMPROVING THE AIR FORCE RESERVE

Tomorrow's operational environment will notably evolve when compared to how we conduct operations today. The return of great power competition, combined with the rapid advancement and widespread availability of digital technology, drives the need to transform our forces so they can generate combat power effectively to win, despite contested environments established by our potential adversaries. This requires fielding new warfighting concepts and capabilities and modernizing existing platforms to meet future threats.

We implemented multiple readiness initiatives, including bolstering training, removing unnecessary requirements, and instituting internal reforms to streamline our operations and enhance support to our Reserve Citizen Airmen. We are prepared to meet both current and future requirements, and we must carry our present momentum forward into the coming years to further optimize our force.

Maintaining Operational Parity with the Active Component

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

ational capabilities are tied to our ability to integrate into the Total Force, therefore we must maintain parity with the Active Component whenever possible.

Concurrently fielding new airframes, aircraft upgrades, and other equipment is critical to sustaining and improving this operational parity. The Air Force Reserve can only provide strategic depth and operational support to the Joint Force in mission areas where our personnel are trained on the required weapon systems, and we are most effective when we can operate interchangeably with our Active Component counterparts. Concurrent fielding enables our personnel to train on the same systems employed by the Active Component, facilitating interoperability within the Total Force. This maximizes the Air Force Reserve's ability to support operational missions and enhances our integration with the Active Component, assuring we are capable of providing the Total Force with the warfighting capability necessary to achieve decisive victory against future threats and in all domains.

In addition to concurrent fielding, the Reserve must recapitalize and divest weapon systems in conjunction with the Active Component. This prevents problems which arise when the Reserve Component continues to operate a legacy system that is no longer used by our active counterparts. In this situation, the Reserve becomes responsible for all aspects associated with that particular platform, such as standardization and evaluations and safety. Asynchronous divestment can also lead to significant sustainment cost growth with diminishing vendors for spare parts. Furthermore, once the Active Component divests a weapon system, the Reserve is unable to hire qualified Active Component aircrew separatees for that specific airframe, increasing training costs and reducing readiness.

Weapon System Modernization and Sustainment

While acquiring new platforms such as the F-35, KC-46, B-21, and F-15EX will enhance our capabilities, both the Active Component and the Reserve will continue to rely on many of the proven platforms currently in our inventory. This necessitates aircraft modernization and system upgrades, which will provide the capabilities needed for the future fight and ensure survivability if operating in a contested environment.

Key modernizations are required to keep our legacy fleet relevant in the prioritized missions outlined in the NDS. Necessary A-10 enhancements include the installation of upgraded mission computers, Helmet-Mounted Targeting, Anti-Jam Global Positioning System equipment, and missile warning systems which will provide enhanced threat awareness and weapons delivery capabilities in contested environments. The A-10 is also undergoing critical flight safety upgrades like wing replacements, which will avert a predicted grounding of 35 aircraft in FY 2023. Our B-52 fleet requires upgrades to radar and defensive systems and the install of advanced data link equipment, and is in the process of integrating Advanced Extremely High Frequency communications capability. The fleet also requires engine replacements to sustain itself through 2050. Our F-16s require active electronically scanned array (AESA) radars to more effectively support homeland defense and other priority NDS missions.

After decades of operating in a permissive environment, we must be prepared to conduct logistics under attack. The C-5 and C-17 are both vulnerable to radar guided missile threats which would be mitigated by the installation of a layered defense and awareness suite. Currently, the Radar Warning System upgrades for both aircraft are unfunded. We are presently installing the Mobility Air Forces datalink system in our C-5 fleet and to equip our KC-135 aircraft with the Real-Time in Cockpit situational awareness system. Our KC-135 fleet is also scheduled to continue Large Aircraft Infrared Countermeasures modifications during programmed depot maintenance. The installation of additional threat awareness and self-defense systems will provide further protection for this aircraft.

In addition to modernization, many of our airframes require upgrades, repairs, and component replacements in order to maintain airworthiness and extend service life. These weapon system sustainment actions are critical to both our mission capability and aircraft availability rates. Maintaining a mission capable aircraft fleet is essential to meeting operational taskings and training our personnel. The lack of weapon system sustainment funding can ground aircraft, hampering our ability to support global operations and degrading our readiness, therefore, the Air Force Reserve will continue to prioritize these efforts within its appropriated funding levels.

Years of continuing resolutions, lack of flexible funding, and an aging fleet have increased weapon system sustainment requirements. Historically, due to competing higher priority requirements, the Air Force Reserve has had approximately 75 percent of our share of these requirements funded. We obligated over \$445 million for weapon system sustainment in FY 2020. Our FY 2021 appropriations are approxi-

mately \$743 million, of which we are on track to fully obligate, with 88.9 percent funded to requirements 27 percent already obligated.

Our current sustainment requirements include measures to extend the B-52's service life by an additional thirty years and to replace this platform's engines with new, more fuel-efficient ones. Our A-10 fleet requires wing replacements and our C-130H aircraft need avionics and propulsion upgrades, which we will prioritize when and as needed.

Internal Improvements

Reforming our organization through internal improvements and increasing our operational efficiency continues to be one of our major focus areas. Our intent is to increase our overall readiness and enhance our ability to support our Reserve Citizen Airmen by streamlining our internal processes and eliminating requirements, policies, and programs which either detract from or do not contribute to our readiness or provide support to our personnel.

In FY 2020, we continued to fill full time healthcare provider vacancies by leveraging ART to AGR conversions. This enabled a 32 percent improvement in processing fitness for duty case completion. The significant process reforms from FY 2019 yielded a 14 percent increase in quality and reduced medical downtime for Reserve Citizen Airmen awaiting a return to duty determination. We were also able to capitalize on the Shared Data Environment to make Individual Medical Readiness reporting more visible to senior leadership. An increased use of Individual Medical Readiness services under the Reserve Health Readiness Program enabled completion of Separation History and Physical Exams to increase from 9 percent to 42 percent.

We are currently accelerating and expanding our internal reform efforts. We identified additional areas within our organization that require enhancement and are working to improve the most critical of these. One of several of these initiatives is the holistic reform of our manpower and personnel programs and processes. We are also identifying processes which create problems for our Airmen, such as pay and benefits issues.

As part of this enterprise-wide initiative, the Air Force Reserve's Force Generation Center is presently improving our mobilization and deployment processes through process and system upgrades. In FY 2020, the Force Generation Center ran a proof of concept test for a Deployment Orders Cell (DOC). The initial test supported 8 units and 595 Airmen. Centralizing this process cut the average orders processing time from 59 days down to 7 days for the Airmen in the test group. This will expedite orders approval, enabling Airmen to receive benefits earlier in the process and reducing gaps in support. These improvements will alleviate problems caused by our current lengthy process, helping our personnel, their family members, and their civilian employers better plan and prepare for deployments.

In addition to our own internal efforts, we participate in Department of the Air Force development and reform initiatives, including the Air Force War Fighting Integration Capability team. We also support and will benefit from the Department of the Air Force's ongoing predictive maintenance efforts and are working to acquire additive manufacturing capability. To date, five Air Force Reserve wings have purchased equipment required to manufacture items in house, which are currently being used for training and familiarization. Personnel at Pittsburgh Air Reserve Base, Pennsylvania and Keesler Air Force Base, Mississippi have completed initial online training but due to the pandemic they have not been able to complete the necessary in person training to manufacture aircraft parts. These two initiatives will decrease aircraft repair time, ultimately improving mission capable and aircraft availability rates.

Exercise Planning

Operating in contested airspace requires both modernized aircraft and trained aircrew. We must ensure all Reserve Citizen Airmen receive realistic training and are fully capable of employing the systems which will be required in the future operating environment. One of the ways in which we are ensuring our ability to operate in a future threat environment is the Deliberate Planning Exercises (DPEX) program. DPEX shifts from an ad hoc method of scheduling exercises to a centrally planned, readiness driven, comprehensive exercise program that deliberately schedules personnel for exercises to boost unit capability toward specific mission essential tasks.

PROVIDING EXCELLENT CARE TO AIRMEN AND FAMILIES

Our Airmen are our greatest asset. They are ultimately responsible for maintaining our readiness, aligning our organization to meet future requirements, and exe-

cutting our operational missions. Their success depends on our support. The Air Force Reserve is absolutely committed to providing excellent care to both our Airmen and their families. This mandates a holistic approach, and we continually seek ways to better support our personnel and enable their personal and professional success. We currently have numerous personnel support initiatives, including reducing the administrative burden on our Airmen, improving education and training, growing our resiliency programs, and providing our Airmen and their families with access to needed resources. Our ultimate goals are to improve the quality of life for our personnel and to foster an environment where people want to stay and serve.

Diversity and Inclusion

Diverse, resilient, and ready Citizen Airmen are the bedrock of the Air Force Reserve's readiness and lethality. The Air Force Reserve continues to fully operationalize Diversity and Inclusion to leverage its remarkably diverse citizenry for decisive, lethal advantage.

As an organization, we are committed to ensuring an environment in which every person is valued and is able to reach their fullest potential. To that end, we have realigned our organization to ensure that the Chief Diversity Officer is a director-level position on the major command staff. We have also ensured that at each wing the vice commander is the Diversity and Inclusion Program Manager and provided training on a quarterly basis for these duties.

The Air Force Reserve is in the process of conducting an internal racial disparity review as a compliment to the Department of the Air Force's ongoing racial disparity review. This review is focused on processes unique to the Air Force Reserve that may contribute to racial disparity in the areas of discipline and career development. The review is being conducted in three phases. The first phase identified processes with the potential for racial disparity. The second phase, which is underway, consists of conducting a thorough analysis of these processes for disparity and making policy recommendations. The final phase will be continuous review and sustainment.

Suicide Prevention

Over the last two calendar years, the Air Force Reserve has experienced an increase in member suicides. Our rates are not going in the desired direction. Losing even one Airman to suicide is a horrible tragedy, with every life having its own deeply personal story.

In response to this heartbreaking trend, we expanded upon our existing support programs and are adding new leadership tools to assist with suicide prevention and intervention. Suicide is a complex interaction of factors; while there is no one "fix," we are committed to addressing suicide comprehensively. The Air Force Reserve Suicide Prevention Program is a comprehensive, evidence-based, multidisciplinary program that is dedicated to a leadership driven and safety oriented culture. Its focus areas are building connections, detecting risk, promoting protective environments and equipping Airmen and their families.

Although the Air Force has found no direct link between deployments and member suicide, all personnel receive mental health screenings before, during, and after deployment and as part of their annual health assessment. These screenings assess suicide risk along with other behavioral and mental health issues. We conduct Suicide Analysis Boards, modeled after safety investigation boards, to identify the causes and contributing factors behind member suicides.

Our intent is to create protective policies and programs which will reverse this trend and bring our suicide rate to the only acceptable number: zero.

Personal Resiliency

The personal wellness of our Airmen and their families is incredibly important. The Air Force Reserve has multiple on base entities which provide support and resources to our personnel. We employ dedicated Sexual Assault Response Coordinators in all wings and Violence Prevention Integrators on all nine Air Force Reserve host installations and at Fort Worth Naval Air Station Joint Reserve Base, where we are the lead Air Force wing. In FY 2019, we began building out embedded Religious Support Teams at our host installations with Religious Affairs Airmen. In FY 2021, we are completing this process by filling 10 Chaplain positions.

In addition, the Air Force Reserve promotes and provides mental health resources as part of the Yellow Ribbon Reintegration Program. This initiative supports Reservists and their family members through pre-and post-deployment events. This program has seen an overwhelming success, with over 97 percent of attendees finding the events beneficial. Over the past year, the program cancelled 14 planned in person events, due to the pandemic, shifting to a virtual delivery model. These virtual events primarily focused on pre-deployers. In 2020, the program supported 902

members and 1561 family members., For the remaining Reservists and their family members who were unable to attend in person events, these members will be eligible for in-person post-deployment events once resuming these events is safe.

Childcare Benefits

The Air Force Reserve has worked to ensure that childcare is available on Unit Training Assembly weekends at no cost to parents through the Home Community Care (HCC) program. Airmen who do not have another adult for childcare due to being a single parent or a dual military couple are eligible for the program. The HCC program mitigates host locations without Child Development Centers and a lack of availability of Active Component facilities on weekends. Currently, the HCC is available or in progress at 41 Air Force Reserve locations, working to recruit providers by zip code.

SUMMARY

We will continue our diligent efforts to meet the intent of the National Defense Strategy, increase our interoperability within the Total Force, and further our integration within the Joint Force while ensuring that we remain a cost effective force that provides strategic depth to the Nation.

Our recent readiness gains would not have been possible without your support. The approval of our FY 2020 and 2021 budget requests enabled us to improve our readiness while maintaining robust support to global operations. Funding from the CARES Act allowed us to rapidly scale telework capabilities to protect our people. Recent legislative actions, such as Direct Hiring Authority, removed barriers to success and improved the quality of life for our Citizen Airmen. The future operational environment will require a capable, modern, and combat-ready force. With your continued support, we are confident the Air Force Reserve will remain prepared to fly, fight, and win, delivering airpower anytime, anywhere.

Senator TESTER. Thank you, General Scobee.

I want to thank each one of you for your testimony here today.

I'm going to start with you, General Hokanson. The Air Force has come under some scrutiny lately for its basing decision for the Air National Guard's C-130Js. After Congress appropriated funds for more aircraft to modernize several units, there were discussions within the Air Force to redirect some of these aircraft to a C-130 training base that was not included in the last basing decision.

So the question is, will all four units, including the unit in Georgia, be fully converted to the modern C-130Js provided in last year's appropriation bill?

General HOKANSON. Chairman, my understanding in working with the Air Force is that all four of those squadrons will convert to the J model over the timeline. I'm not specific on the last one. It'll depend on additional purchases, but the goal is to get all four converted to J models.

Senator TESTER. Okay. And can you tell us, because this directly relates to the answer you just gave, what is the timeline for redistributing the H aircraft?

General HOKANSON. Chairman, my understanding in working with the Air National Guard, as soon as the J models are available that they'll start moving the other, the H3 models and 2.5, to the units with the oldest C-130s so that we can retain the capability and capacity our Nation needs.

Senator TESTER. So if you don't have it at your fingertips now, is it possible to get us that timeline since you said you didn't have it?

General HOKANSON. Chairman, absolutely, we'll take that for the record.

[The information follows:]

—*June–August 2021*: Texas and West Virginia C–130H3 aircraft depart to Connecticut and Montana.

—*June–December 2021*: Texas and West Virginia receive 5 C–130J aircraft each.

—*June–September 2021*: Connecticut and Montana divest their C–130H1 aircraft.

—*June–September 2021*: Connecticut and Montana receive the C–130H3 aircraft that departed Texas and West Virginia.

—*July–November 2021*: Kentucky C–130H2.5 aircraft depart to Delaware.

—*July–November 2021*: Delaware C–130H2 aircraft depart to various locations.

—*October–December 2021*: Kentucky receives 2 C–130J aircraft.

Senator TESTER. Okay. Thank you.

There have been discussions throughout the year, mobility capabilities and requirement studies, on this total end strength for Air Force's 130 fleet.

Can you comment on the Air National Guard's requirements?

General HOKANSON. Mr. Chairman, we're waiting. I know in July is when the mobility capabilities requirements study comes out and previously they have not included the domestic requirements here in the United States and so we're asking that they consider that because we think that that may influence the actual number of C–130s that the Air Force would retain.

Senator TESTER. All right. Okay. Yes. And so how many C–130s is the Air Force Reserve seeking to upgrade?

General SCOBEE. Chairman, right now in the Air Force Reserve, we are in good shape across the spectrum in our C–130s.

What we have prioritized is (1) upgrade of our H models and making sure that they're still viable going forward and the other thing is in our special missions. You're very familiar with our fire-fighting capability, our aerial spray capability, and our hurricane hunters.

The hurricane hunters have already been upgraded to C–130Js and right now we're looking at between our fire-fighting mobile airborne firefighting units and the aerial spray units to also upgrade those to C–130Js and we're on the timeframe to do that now with the Secretary of the Air Force.

Senator TESTER. Thank you.

This is a question for all of you. The horrific crime of sexual assault is finally getting the attention it needs from this Administration, and I commend Secretary Austin for calling for a 90-day independent review commission.

So to all of you, why is sexual assault on the rise in many of your components? Is there a difference between units or regions of the country or is it a command climate issue?

General BELLON. Senator, I first want to start by acknowledging that the service takes sexual assault extremely seriously. We understand that our most solemn obligation is to the families and the citizens who give us the young Marines and sailors who elect to serve and our moral obligation is to provide a safe environment for them to develop not only as sailors and Marines but also as citizens.

So there is no course of action that Congress may suggest to increase the opportunity for safety and to increase the overall wellness of those Marines and sailors that we would even begin to

think adversely about. So we're open to all COAs in order to get us to a better place.

I do acknowledge that within the Marine Corps the reporting has increased. There's several different ways to look at that and one of that is that, you know, the first thing we had to do is establish credibility with the force that by reporting they could trust the institution to do something about that and we believe that that's part of the increase in reporting. That by no way mitigates the actual crimes that are being committed.

So what we're trying to do with overall health and wellness of the force, particularly with sexual assault, is to continue to educate, continue to hold accountable those transgressors, and to increase the overall safety at all bases and stations for our young people.

Senator TESTER. General Daniels.

General DANIELS. Across the Army Reserve, we're seeing our numbers declining. However, that does not make us a perfect organization as any of these numbers is just too many.

So we're still tackling the challenges. We're working on our command climate. We're working on using—this is my squad philosophy to get after those conversations, to have soldiers and their leaders have much greater interaction and knowledge of backgrounds, to make sure that we're treating everyone with dignity and respect, and they're all brought in.

We've done an extensive effort to retrain our lawyers and refresh their capabilities so that they have immediate conversations with all new commanders so that commanders know and understand their responsibilities should these allegations come forward.

We've had a lot of retraining and reinvigorating of knowledge of dignity and respect across all of our formations and we will continue to do so. We're taking a hard look at how should our programs be structured. Is there a difference between preventative measures and then response measures? Should these programs be delivered in different methods, and so we're taking a really hard look at all this to help our force turn out a much better outcome.

Thank you.

Senator TESTER. General Hokanson.

General HOKANSON. Chairman, shortly after becoming the Chief of the National Guard Bureau, we stood up a sexual assault task force because obviously what we've been doing in the past has not made a significant difference and so we're looking across all 54 States and territories and D.C. to look at those programs that seem to show promise and make sure that we invest in that, and I'm looking forward in June to see the readout from that group.

Some of the things that we learned is obviously alcohol and bystanders are a factor. We need to address that immediately. Also, the training of our sexual assault response coordinators is making sure we get enough class dates for them, so we have trained personnel in all of our organizations, and, frankly, sir, as the father of a daughter that serves in the military, this is intolerable and it is something we must address at every venue.

Senator TESTER. Thank you, General.

Admiral.

Admiral MUSTIN. Not surprisingly and very consistently amongst all the Reserve chiefs, the elimination of destructive behaviors of every kind is, first and foremost, on our minds.

We also, as General Daniels mentioned, are seeing a reduction in the numbers of sexual assault. We peaked in 2019. We saw a slight decrease in 2020 and are on glide slope now to continue that decrease.

I agree that the increase in reporting is helpful. We've determined now that the culture of excellence umbrella concept is designed to demonstrate what right looks like. So the creation of a culture wherein every sailor can serve in an environment where they're not only safe but they're encouraged to perform is the outcome we seek and, frankly, while we see—the elimination, of course, is paramount, but every single incidence is one too many.

And so we are all driven together and this is not a Navy Reserve initiative but a Navy initiative. So our culture of excellence is the umbrella concept. Our task force One Navy recently did a deep dive across multi-constituent/multi-stakeholder leadership to determine what is it that we can implicate at the lowest ranks where we see the predominance of reporting and of incidence.

So we continue to look at that from the bottom up as well as from the top down, but I think you'll find consistency amongst all of us in our approach.

Senator TESTER. And General Scobee.

General SCOBEE. Chairman Tester, as you can hear from my fellow witnesses, we are in lockstep on our way forward and, in fact, we meet on a regular basis to discuss issues just like this.

This tears at the fabric of who we are as the Department of Defense and while we continue to make strides in supporting our victims of this scourge, we also recognize that sexual assault is a persistent challenge that we will have to work with together and it's not easily beaten by any stretch.

One of the things we're working with specifically in the Air Force Reserve Command is ensuring we have a climate that does not promote this type of behavior and we remove the opportunity at every chance we get the opportunity to do.

The other thing is the currency we work in within the Department of Defense's trust and our airmen, especially if they've been victimized by this, have to trust that we as commanders will do the right thing for them and get them the help that they need and all these things we're working together to ensure that we're doing for our members.

Senator TESTER. Thank you.

I apologize to the committee members for running over, but this is an issue that has to be addressed, has to be addressed ASAP. As one of you has already pointed out, even one incidence is one too many.

Senator Shelby.

Senator SHELBY. Thank you.

General Hokanson, I'm concerned about the enduring cost of having National Guard and Reserve troops here on the Capitol Grounds. I have two questions.

One, what is the impact of those costs to your budget, 2021 budget, and, two, at what point do you truly reach a budgetary breaking point if you do not receive resources to backfill those costs?

General HOKANSON. Senator, the cost since January 6 is about \$521 million to the National Guard and we've cash flowed that through our pay allowances and operations and maintenance funds.

We will need that funding back in our accounts by the first of August. Otherwise, it will impact our drill periods for both August and September.

Senator SHELBY. In the area of readiness and modernization, General Daniels and General Hokanson, this question, can you tell us here more about the requirement behind this new model, how it will be resourced, and what overall improvements it will provide for our Guard and Reserve components in the Army?

General Daniels, you want to start?

General DANIELS. So, I'm sorry, the REARM Model, is that—

Senator SHELBY. Mm-hmm.

General DANIELS. Yes, sir. So what that will do, it will allow us to do multiple different things. One is to have regional affiliations, habitual relationships with units, and it will also give us additional predictability in terms of how long we're going to be spent during modernization, training, and then mission. So it will allow us to get into a very predictable cycle for our units and that will help the employers and the families and the service members know when they're going to be going off and doing these missions.

General HOKANSON. And, sir, with the National Guard, the benefit there is if you look at our State partnership, we're already regionally aligned and particularly with the Army National Guard, we've taken our eight divisions and actually allocated the subordinate force structures so they're actually eight full divisions. So that will allow us to help deter and also be part of the total Army so that we can align those units and develop long-term training relationships not only with our State partners but also in those regions.

Senator SHELBY. General Hokanson, with the recent riots and cyber attacks against the U.S., what's the National Guard's role in defending the homeland from cyber attacks, and how is it working with other Federal agencies with similar responsibilities?

Finally, does the Guard have the resources it needs for cyber defense, the personnel and everything?

General HOKANSON. Yes, sir. If you look at our cyber forces, we have about 4,000 cyber professionals within the National Guard and that's in 59 units and 40 States. We also have what's called a Defensive Cyber element in each State and we did a year-long study under the CMAT (Cyber Mission Assurance Team) Program which basically looked at a CST-type and what came out of that is we believe that establishing those existing units to be aligned with what Cybercom would utilize and we would man, train, and equip them the same. They would provide that capability within each State.

If you look over the past year and a half, we had two incidents, both in Louisiana and Texas, where the Governors activated their cyber professionals within the National Guard under State Active Duty to address a cyber attack, one to a school district and another

one to a county, and using Louisiana as an example, they were able to come in and mitigate the ransomware and save tens of thousands of IT systems which, as we all know, is something a school district could not absorb with their budget.

Senator SHELBY. General, the CBO (Congressional Budget Office) in the area of Space National Guard and Reserve that you mentioned earlier, the CBO has estimated that an additional \$100 million annually will be required to create a Space National Guard and Reserve unit with a bill up to \$490 million annually for a larger Space Guard.

Given the level of defense funding proposed by the current Administration, how does the National Guard plan to prioritize resources for modernization while also standing up a new service component and do it without more resources?

General HOKANSON. Sir, the actual cost is about \$200,000 and that's just to change the name tapes on their uniform and the sign outside their buildings and the flags of the unit.

The units already exist. They're already performing the mission today. We don't need any additional MILCON (Military Construction) or any additional over-structure. We basically just take the folks that are doing today and instead of Air Force, it says Space Force on their name tag with an extra weekend.

Senator SHELBY. That's good news, best I've heard in a long time. Thank you.

General HOKANSON. Yes, sir.

Senator TESTER. Senator Durbin.

Senator DURBIN. Thanks very much, Mr. Chairman.

I want to focus for a minute on January 6 and ask General Hokanson as follows. If we use some 26,000 National Guardsmen, and I thank all of them, their families, for their service to our country and sacrifice, as well as others, COVID-19, but if we use some 26,000 to protect this Capitol after the insurrectionist mob overran the Capitol on January 6, conversations are ongoing about what to do next.

I'm afraid all the prospects are terrible in terms of the access of the public to this building, but I wonder if you were in on those conversations and whether there's a basic question asked as to whether we have to go beyond the National Guard and Reserve and really think of a permanent military presence on Capitol Hill.

General HOKANSON. Senator, with respect to that, I was basically in many cases just asked to provide force and so I worked directly with the 54 to make sure that we got the personnel that were required to get here.

When I did get a chance to read the Task Force 1-6 report, looking back, I tend to agree with the Number 1 requirement that there's a lack of number of U.S. Capitol Police officers which caused the reliance on other agencies and so when I look at this as a Guardsman, I see this primarily as a law enforcement issue and I think it would be a law enforcement solution to that.

Obviously until that capability is there, the Guard is there to do whatever we're asked to do and currently, sir, the 2,300 that we have here today are scheduled to end their mission on the 23rd of May and we are not aware of any requirement beyond that and so at that time our folks will all go home.

Senator DURBIN. well, it really raises a basic practical question. If the complement of law enforcement is not adequate to the challenge, for instance, the thousands that left the President's rally and came marching up here to crash through the windows and doors and to assault the policemen and that, there was need for supplemental help for sure,—

General HOKANSON. Yes, sir.

Senator DURBIN [continuing]. And it took several hours but they arrived and finally brought the Capitol back under control.

I'm just asking whether or not that is something that is naturally a National Guard function or should be a regular military function.

General HOKANSON. Sir, if we look at our full-time manning within the National Guard, they're basically there to administer and train the part-time force. We don't really have any forces that are there full time with a dedicated mission set and so for us to do that, it would cause some legislative changes for the National Guard to do that.

Senator DURBIN. Okay. Let me ask a follow-up question. At the heart of domestic terrorism in America, according to the FBI (Federal Bureau of Investigation) and the Attorney General, is white supremacy, racism, white nationalism. We're seeing in those who were arrested and charged with January 6 veterans of the military and I think in one instance, at least one, Active military who were participating.

So if the issue of sexual predation should be dominant in our thinking, so, too, should the issue of racism in the ranks.

General HOKANSON. Yes, sir.

Senator DURBIN. What are we doing, what are you doing to deal with this issue and to make certain that it is not a challenge to the integrity of your unit?

General HOKANSON. Yes, Senator. So we follow very closely the training requirements of both the Army and the Air Force and, frankly, there is no room for extremism of any sort within our organization and so we rely on our lower level commanders and our adjutants general when they identify personnel that may be susceptible to this that they either address it within the military chain of command or within local law enforcement, whichever is the appropriate means.

Senator DURBIN. So let me ask, General Bellon, would you like to comment on the same issue?

General BELLON. Sir, at this time we're adequately resourced. We project forward. As you know, the service is in the middle of a force design and the commandant has made it very clear that we're looking at reinventing ourselves within the resources we currently have and so at this point in time, we're not asking for additional resources.

Senator DURBIN. Sir, I'm sorry, on the issue of race and discriminatory conduct and such, would you comment on what's being done?

General BELLON. Yes. I think, as we talked about before with sexual assault, the first part is acknowledging it and I can report to Congress at every level of the Marine Corps as I engage from second lieutenants in Quantico all the way up to my peers, we are

actively acknowledging the problem, and it is not a nice to have, it is not an additional burden for us to solve. It is a primary problem set within the culture of the service.

By talking about that and by signaling at every level that this is the priority, then the natural culture of our service to align, follow orders, and execute priorities kicks into effect, and from my experience, the level of candor that goes on in the conversations right now, I've never seen anything like it on any issue.

The acknowledgement, the candor, the sharing of the different underrepresented populations about what their life is like as a minority, for example, or what they perceive on social media and how it contradicts our culture is exceptional, is exceptional right now and that's the beginning.

Senator DURBIN. Thank you for that, and there have been programs. I won't take any more time of the committee this morning, but there have been programs which have suggested that even though we nominally ended racism in the military in the 1940s under President Truman, the reality is much different and I think that can be said across America in many different venues.

I think we have to take a very honest, forthright, and open position on this, that if you're a racist, you have no place in the military. If you're guilty of sexual predation, you have no place in the military.

I hope that that is clear and I'm going to ask each of the branches to respond as I don't want to take any more time this morning.

Thank you.

Senator TESTER. Senator Collins.

Senator COLLINS. Thank you, Mr. Chairman.

General Hokanson, as you indicated, the year 2020 was unprecedented in terms of National Guard activations and deployments. The main Guard, for example, has deployed service members to our southern border to assist the overworked and overwhelmed Border Patrol, to Africa to help with security missions, to Washington, D.C., to provide support for our Capitol Police, all the while assisting the State of Maine with clinics and logistics and responding to the pandemic.

During all of this activity, the Air Guard Wing in Bangor, Maine, continues its extraordinary work refueling our tankers.

General, the average age of the Maine National Guard's 10 KC-135s stationed in Bangor is over 60 years old. They are pressed into service to operate all over the world and Bangor's a critical location for flights crossing the Atlantic.

Can you provide us with some insight on the roadmap that the Guard and the Air Force are using to recapitalize this aging tanker fleet and ensure that units like Bangor, which are in strategic geographic locations, are able to continue their vital mission long into the future?

General HOKANSON. Yes, Senator. So when we look at the recapitalization with the KC-46 fleet, the next analysis are for 7 and 8, are coming out I believe in 2023, and so they'll look very closely at each of the mission sets, the locations, and the unit's capability to convert, but between now and then and actually long after that for the rest of our KC-135 fleet, it's absolutely critical to our Na-

tion's defense not only in terms of day-to-day requirements but also other requirements, as well, and so we're working with the Air Force to make sure we've got a 25-year plan.

I think some of these aircraft may be approaching a hundred years old, but the recapitalization and investment in those air frames is critical so that we can maintain that required capability and capacity for our Nation.

Senator COLLINS. Well, I would welcome your coming to see the Air Refueling Wing and would be delighted to host you for a visit. I think you'd be very impressed.

General HOKANSON. Yes, ma'am, would love to get there.

Senator COLLINS. I recently traveled to the southwest border and witnessed the ongoing crisis there. I very much appreciate the work of the Maine guardsmen and women who have been supporting the Border Patrol in Arizona. I happened to go to Texas.

I understand that the Department of Defense has received a request from the Department of Homeland Security to continue supporting these border deployments beyond the end of the fiscal year.

What is the status of the planning to extend the Guard's presence into the new fiscal year?

General HOKANSON. So, Senator, we received that request recently. I know it's going through the Office of the Secretary of Defense right now to determine how that's going to be resourced going forward with the rescinding of the Declaration of National Emergency, a Title 10 authorization.

We're looking out for the guardsmen to potentially fill that but it may be Active component, but they're looking at all options right now, ma'am, but we know the current units that are scheduled there are to come home on the 30th of September. So we're making sure that we do this as quickly as possible to notify those forces so that there's no break in coverage.

Senator COLLINS. Given the 20-year high in the number of migrants crossing the border, it is evident that the Border Patrol agents simply, though they work so hard, are overwhelmed and really need assistance. So I hope that will be approved or that Active Duty forces will assist them.

Thank you.

General HOKANSON. Yes, Senator.

Senator TESTER. Senator Feinstein.

Senator FEINSTEIN. Thanks very much, Mr. Chairman.

My question is of you, General Hokanson, and I very much appreciate your highlighting the California National Guard's very heroic efforts battling wildfires.

Last year alone, four million acres in California burned, 10,000 structures were destroyed, 5,000 of them homes, 31 people lost their lives. So I am very interested in what the Guard can do to be helpful to us.

Do you have any suggestions that you might care to make?

General HOKANSON. Senator, thank you for the question, and thankfully there was a river between one of those fires and my parents' house.

Senator FEINSTEIN. Wow!

General HOKANSON. But when we look at the way we fight forest fires, we've really kind of taken the approach that we've learned

from hurricanes and this March was the first time we actually had a wild land firefighting symposium where we brought all the States together that fight forest fires along with the National Interagency Fire Center to take really a different approach because it's no longer a fire season. We start to call it a fire year now.

What we've tried to do is identify, particularly in California, Washington this year where aviation units may be deploying, and identifying States to make sure that they train their air crews so they can fill that gap in case there's a need in California or any of the States that fight wild land firefighting.

We're also looking at the ability when we look at some of our Title 32 Active, Guard, and Reserve personnel. Traditionally, they are only on for 72 hours under immediate response authority.

We're working on a policy which I should have completed by the end of the month to give adjutants general the ability to retain some of those personnel on an emergency basis to help support firefighting because it's absolutely critical our leaders are with them at all times.

Senator FEINSTEIN. I note that—first of all, thank you for that answer—that some 14 percent of the Guard members lack health insurance. It's my understanding that while on Active Duty orders for more than 30 days, guardsmen are eligible for military medical coverage. However, once their orders end or if members are activated for less than a month, they have fewer options.

Would this be something we might be able to do to be helpful and encourage people to remain in the Guard and serve as your Guard serves in California which is really top of the ladder?

General HOKANSON. Senator, that would be—that's my Number 1 legislative priority is to get premium free healthcare for all of our guardsmen.

When we look at the past year and what we asked them to do, particularly we did not know what a COVID environment would be like, we always want the family members and the service member to know that no matter what we ask them to do because we ask them to be ready at any time, that they're medically ready and if anything happens, if they're injured or sick before or after their duty, that they know that they're going to get the care they need to continue their civilian employment or their military employment.

One of the other things we're concerned of is when you go from orders, sometimes you have to change medical care from your civilian provider to Tricare and in some cases they'd have to find new medical providers, but by it being a standardized process and coverage, they could keep that same healthcare provider through all of it which we think is really important.

And lastly, ma'am, one of the things we've looked at is when we look at the number of soldiers and airmen that don't have healthcare coverage, if they have access to mental health care or counseling, if that might benefit the number of suicides that we have in our organization.

Senator FEINSTEIN. Well, thank you. I'd be very happy to work with you on that and I would suspect other members would, as well.

I'm a big fan of the Guards and when these wildfires come to California, we really see with great appreciation their service. So I want you to know that.

Thank you very much.

General HOKANSON. Thank you, ma'am.

Senator TESTER. Senator Murkowski.

Senator MURKOWSKI. Thank you, Mr. Chairman, and thank you all for being here this morning and for your service.

General Hokanson, I'd like to start with you, if I may. In recent conversations that I've had with Major General Sacks, he's the Alaska TAG, we were discussing the search and rescue mission there in Alaska and the 176 Wing located at JBER (Joint Base Elmendorf-Richardson). There are three rescue squadrons, you're familiar with them, which utilize the HH60 in their operations.

We're told that the HH60s belonging to the 176 have the highest operational tempo in the Air Force and the highest utilization rate. We know that the Wing needs some additional and some upgraded H60s to keep up with the mission demands and to support the growing focus the DOD (Department of Defense) has placed on the region, on the Arctic region.

The current plan to bed down additional aircraft in Alaska isn't targeted until 2026 and so you've got kind of a misalignment there, if you will, with the growth in mission requirements, the operational requirements, and the aging of the existing helicopters.

So can you update me? Are there options that exist to allow for perhaps a reprioritization of these assets, and then also is the utilization rate calculated into the decisionmaking process?

General HOKANSON. Yes, Senator, and so obviously as a former rescue pilot, I follow 176 very closely, and they do an incredible amount of rescues and—

Senator MURKOWSKI. They're amazing.

General HOKANSON [continuing]. Make a huge impact every day, and I'll be working with the Air Force. I'll make sure, Number 1, that we have no gap in coverage in terms of the number of aircraft there, but also ask that they take a look at, based on the operational tempo and the requirements, particularly unique to Alaska, especially as the Arctic begins to open more and there may be additional requirements for them in that area.

I know the future combat rescue helicopter, once that's online, our maintenance rates should go up on those, but between now and then, I think it's 2026, I'll continue to work with the Air Force to see if we can get reprioritization or additional aircraft to cover the gap.

Senator MURKOWSKI. Well, I appreciate your eyes on that and the fact that your background allows you to be intimately familiar with their mission. I appreciate that, but we are concerned about any potential for gap because what they do and what they provide is extraordinary unique and they truly are the best of the best there.

I appreciate your response to Senator Shelby here with regards to the Space Force. As you know, we currently have members of both the Guard and the Reserve in Alaska that are working to support the Space Force missions there in Alaska.

I understand that you've given a little bit of background in terms of the CBO score and the cost but know that we're certainly at the ready to do what we can to help with that very important mission.

Another question to you relating to suicide and mental health issues. This is something that I have paid particular attention to within this subcommittee, making sure that our service men and women and their families are cared for.

We all know that this past year has been tough on everybody and you couple the effects of the pandemic with the challenges that you have in certain areas, particularly remote assignments, like Alaska, but I don't know if you can speak to the statistics within the Guard, whether we've seen an increase in suicides this past year, and then what more we can be doing to provide those levels of support for mental health and behavioral health issues that may exist within the National Guard.

General HOKANSON. Senator, we actually watched this very closely over the past year and at the end of 2020, we were actually just one below our 10-year average, but, frankly, any one is devastating, not only to the family but also to the organization, and I actually stood up a Suicide Prevention Task Force to take a look at what we're doing across the entire National Guard.

Coming into today, we're about five below where we were last year at this time, but, once again, any single one of those is just a devastating impact to the entire organization.

One thing that we've done is we've looked at some additional programs and we have 27 pilots that we're running, pilot programs. We reached out to the 54 States and territories that they brought up as potential benefit to our service members, and one I'd like to highlight is called SPRING. It's the Suicide Prevention Readiness Initiative for the National Guard.

What it does is it takes existing data from every county in the United States and identifies potential risk factors and when they reach a certain level, the adjutants general and the commanders wit State can assess a region based on the things that are taking place within those counties and also hopefully preventively address that and provide additional training or counselors within that region to make sure that our service members know that there's opportunities for them to discuss any concerns they might have.

Senator MURKOWSKI. Appreciate that. Mr. Chairman, I think that's an interesting approach, recognizing that oftentimes these factors are community-based, regionally-based. So I look forward to knowing and understanding a little bit more.

Thank you.

Senator TESTER. Thank you.

I believe we have Senator Schatz virtually.

Senator SCHATZ. Thank you, Mr. Chairman.

Thank you to all of our panelists. I want to continue the line of questioning from Senator Murkowski regarding mental health access and suicide prevention.

You know, I think there's two issues. One is making sure that Guard members, while being deployed, don't feel stigmatized from accessing mental health services and the other is, to the extent that we're making progress in that area, in reducing stigma and encouraging everybody across our society to understand that men-

tal health is just health and that every Guard member ought to access those services, I worry a bit about the transition from deployment to regular life when they have access to all these great services and programs and initiatives that you've started up and then they're back to their regular life and may need continuing mental health services and that transition can be challenging.

So could you speak to both issues, the stigma issue and then how do we transition when someone's coming out of their deployment?

General HOKANSON. Yes, Senator. So when we look at the day-to-day, the stigmatism related to that, when folks come off deployment, they have the opportunity to meet with medical professionals on their way out and they can request help and they can also be aware of the services available to them and that extends for about 6 months post deployment.

Also, they do a periodic health assessment, which allows them to go online and fill out a lot of questions and having recently done it, they ask a lot of questions, if they have any mental health concerns, if they'd like to see someone, and they can do that really anonymously.

Now with respect to the enduring concern, this really goes back to my Number 1 priority legislatively and that is to pursue Tricare Reserve Select for all of our guardsmen where they don't pay for any principal related to that.

The key there is that way, it's always available to them because you never know when you're going to need it because your life situation can change at any time, but knowing that they can get mental healthcare or see a counselor, I think is something that we don't know the benefits of but I believe it certainly will help.

Senator SCHATZ. Thank you, General, and you certainly have my support for that very important legislative initiative.

Moving on to the Asia Pacific Region, you know, I have talked to Indo PACOM commanders or ambassadors in the region. Everybody loves the State Partnership Program. So I'm wondering if you could just help us to understand how we can use the State Partnership Program to support Indo PACOM Pacific deterrence initiative.

General HOKANSON. Yes, sir. So when you look at the National Guards, over 20 percent of the entire Joint Force and specifically to the Indo PACOM Region, we have 13 state partnerships. In fact, as the adjutant general of Oregon, I had state partnerships with both Bangladesh and Vietnam, and the great asset that it provides to the Indo PACOM commander is we're fully integrated into their theater security cooperation plan and these enduring relationships that we've built with these countries also is an additional U.S. presence but also gives us many times the opportunity to counter some of the messaging that they receive from China and other countries.

So I think it's absolutely critical we continue that and we're in close coordination with Indo PACOM to help in any way we can with their Pacific Defense Initiative.

Senator SCHATZ. One final question. You know, we lose some time obviously during COVID as everybody did with partners and just wondering how we're specifically focusing on relationships that were maybe tenuous but being built and then COVID interrupted

that relationship-building in the context of the State Partnership Program.

Are there particular countries that we're sort of anxious to get moving again in terms of our partnerships with?

General HOKANSON. Yes, Senator, and, in fact, I would say we're pretty anxious to get back with all of them as quickly as we can.

The one thing that was nice is I think on both of our parts, our part and our state partners, we realized the limitations we had in terms of travel and so we're able to find virtual ways to connect with them, continue our relationships, but we're very much looking forward to the ability to travel to all of our state partners as soon as possible to continue to develop those relationships.

Senator SCHATZ. Thank you. On energy resilience, I just wanted to flag the President, as you know, issued an Executive Order establishing a Federal Clean Energy Standard. This may not have immediately been risen to your desk, but I'm going to submit a question for the record about the particular ways in which you're going to have to change your procurement process in order to comply with the President's Executive Order, but I'll submit that to you for a response for the record.

Thank you.

General HOKANSON. Thank you, Senator.

Senator TESTER. The Senior Senator from Kansas, Senator Moran.

Senator MORAN. Mr. Chairman, thank you for that recognition. Assuming that it has nothing to do with age, I appreciate it.

General Hokanson, there's a pilot program that was authorized in the NDAA (National Defense Authorization Act), in the fiscal year 2021 NDAA that would allow the testing and development of National Guard partnerships across state lines in regard to cybersecurity.

The opportunity was for the private sector to participate. In one State, the National Guard in that State then be able to assist other National Guards in another State in regard to training, preparation, response to a cybersecurity attack. I don't think it's necessary to say but something that's hugely important and front and center for all of us.

As you know, I think, the Kansas National Guard is home to some of our Nation's best cybersecurity operators and we also have a number of civilian stakeholders who are interested in assisting in that mission. So that pilot program has been authorized.

My question is if we provide you with proper funding, is the DOD prepared to pursue, make the assessments, tell us how that program might work, and do you foresee any roadblocks that would prevent the mission that is contemplated by this pilot program from being accomplished?

General HOKANSON. Yes, Senator. So I'm looking forward to seeing the end results of that, but what we've done internally is take a look at that, as well, and I really look at cyber in many ways like a hurricane. So we need additional truck companies to come down there and the same with cyber.

If we need additional cyber help through the EMAC (Emergency Management Assistance Compacts) process, we can move them State to State to provide that capability, and in some cases, they

don't even need to move. They can operate from their current location. So that's very important.

But I think to your point, a lot of our relationships with the civilian providers or companies that have, you know, exquisite experience and many of our guardsmen work for them and they bring that to their cyber jobs is absolutely critical, but when we look at the fact that we're literally, you know, at war every day on the cyber battlefield, it's important that our guardsmen are trained and up-to-date and they can respond wherever they're needed within their communities and that's where we look at the State Active Duty capabilities under the authority of the Governors to address issues within their State or request help from outside the State.

Senator MORAN. General, in my words, I would say that you're telling me, telling the committee that this has value, and in part it may be accomplished regardless of the outcome of the pilot program with the active participation of you and those on your team to accomplish it. Is that a fair assessment of your response?

General HOKANSON. Yes.

Senator MORAN. And you know of no roadblocks that I need to be pursuing to remove?

General HOKANSON. Sir, not at this time. We'll have to work specifically with each of the States because some of them have different laws that have to be followed, but we work very closely with the 54 to look at overarching policies that we can put across the entire organization to facilitate the need to address any issues within our communities.

Senator MORAN. Also, thank you for recognizing what really takes place in Wichita with our Red Team in the private sector who employs those Guard members and then that gives them the capability to devote significant attention and expertise to national security matters. I appreciate you knowing that.

Let me ask all our witnesses. DD-214 reform, one of the things we're trying to overcome is the tremendous burden that members of the military and their families encounter when they leave the service and my goal is to make it simple for National Guard and Reserve members to keep track of their records of deployment.

My question is would you support, do you support providing a comprehensive document of military service for the Reserve component similar to the DD-214?

General DANIELS. I'll say absolutely, yes, sir, we would very much welcome that so that it's easier for members, once they've served, to show that they have served and it's a universally-accepted document.

Senator MORAN. Has General Daniels received any criticism or disagreement from any of her colleagues?

[No response:]

Senator MORAN. Let the record show that all are in agreement.

My final question in my last 46 seconds, the Moms Leave Act. Last year a bill that I authored authorized maternity leave for mothers in the Reserve component. That bill was signed into law.

Women in the Guard and Reserve across the United States are waiting for the department to implement this law so that they receive comparable support to their Active Duty counterparts.

Does the department require any clarifying language? Are there any challenges in getting this implemented so that those mothers, mothers-to-be and mothers that are currently in that circumstance can receive the benefits of this legislation?

General HOKANSON. Senator, I would say we're working very closely with OSD (Office of the Secretary of Defense) on implementation guidance and we think this is absolutely the right thing to do for our reservists to be treated exactly like their Active counterparts, and it's an acknowledgement that we need to recognize their service and adjust accordingly.

Senator MORAN. Anyone else have a response?

General SCOBEE. Senator Moran, it's Rich Scobee here at the end of the table from the Air Force Reserve.

We are in lockstep with what General Hokanson just talked about. In fact, the Reserve chiefs met last week to discuss this very issue and so as the department determines how this is going to be fleshed out across the board, they are working hard with our elected officials to ensure that we get this Act.

Any barrier that we have to anybody being able to serve within our commands is extremely important that we get through and that's what we're working on.

Senator MORAN. Thank you. General Daniels.

General DANIELS. As stated, we did talk just like 3 days ago about this very matter. So this is high on our list of implementation actions.

Senator MORAN. Thank you. It might be hypocritical for me to complain about the length of time it's taking for implementation because it took a significant amount of time to get it passed through Congress, but it is important and timeliness does matter.

Thank you all.

Senator TESTER. Senator Shaheen.

Senator SHAHEEN. Thank you very much, Mr. Chairman, and thank you to each of you for your service to this country and for your testimony this morning.

General Hokanson, I want to begin with you and actually I should say I should start by echoing the remarks of the Chairman and so many of my colleagues with thanks to the Guard for all of their extraordinary efforts over the last year as we have battled COVID.

In New Hampshire we could not have done it without the National Guard, and they have been on consistent deployment now for over 400 days. So I think it's imperative for all of us to thank everyone for what they have done. It has made a huge difference. So thank you very much.

I want to go back to Senator Collins' questions about the KC-135s because, as you're aware, the 157th Air Refueling Wing at Pease was the first National Guard Base to get the KC-46s and we were so excited about that. We said good-bye to our last KC-135 with the anticipation that we would get those 46s and they have come in and now we're the first Guard base to get all of our component of the tankers and we can't use them and it's really frustrating and I know you all share in that frustration.

But there were serious concerns voiced last year about the retirement of our legacy tankers because of the delays in getting the

KC-46s operational and, in fact, in the fiscal year 2021 NDAA, we restricted divestment of the KC-10 and KC-135s.

Now I understand that the President's budget has been released or at least the outline and it states that retiring legacy systems should be a priority for the Defense budget this year.

Do you agree with that position and perhaps I should ask, General?

General HOKANSON. Thank you, Senator. So when I look at the—obviously we do need to modernize, but we also must retain the capability and capacity that our Nation needs. So in some cases, although we have legacy systems, until they're modernized, I think it's important that we continue to retain like the KC-135 to meet all the requirements of our Nation.

Senator SHAHEEN. General Scobee, do you agree with that?

General SCOBEE. Senator Shaheen, I appreciate that question very much.

It is vital that the Air Force is able to project power across the world. The KC-46 is the linchpin in that. As General Hokanson said, he's exactly right, we are trying to balance the new equipment we bring in with modernizing the KC-135 and those two air frames are going to be what take us into the future.

Having had the opportunity to fly the KC-46, two things I was able to take from that. One is I'm not as good of a pilot as I used to be, and the other thing is, is that it's an incredibly capable machine and I know that General Van Ovost at AMC (Air Mobility Command) is going to make sure that we get all the capabilities out of that we can, and it is also fielding the Air Force Reserve now. So my confidence is high we are on the right path forward.

Senator SHAHEEN. Well, thank you. I've had a chance to fly on it, as well, as a passenger and was very impressed with the potential, and I guess that adds to the frustration around it.

Now I understand that the 46s would be able to perform other missions and particularly aeromedical missions are on that list and that makes our Guard in New Hampshire very excited, but one of the challenges to actually doing those missions if a new problem that's come up and we don't talk about that as much as we do the remote vision systems, but the air transportable galley lavatories, basically the bathrooms, the ATGLs (Air Transportable Galley-Lavatory) are now a problem that I guess we're going to have trouble flying some of those missions until that gets fixed.

Do you have any sense, General Hokanson, when that's going to happen and what I can tell the 157th in New Hampshire about when they might be able to fly those missions?

General HOKANSON. Ma'am, I do not, but we can certainly get back to you on the exact dates until that's resolved.

Senator SHAHEEN. Thank you. Also a question for Boeing as we see this come up, when we didn't realize—we thought we had nailed down the other issues with the tanker and this has become a new problem. So thank you. I would appreciate knowing more about that.

I have a final question for you, General Hokanson, because one of the challenges that—and I guess, General Daniels, this is a concern for you, as well.

One of the challenges our Guard has in New Hampshire is with the age of some of our facilities. They are decades-old and replacing those has been costly. The State doesn't have the funds to do that at this point.

So can you talk about how important it is for us to replace some of those facilities so that our Guard and Reserve are prepared when they're called up?

General HOKANSON. Yes, Senator. If you look within the National Guard, 26 percent of our facilities are over 60 years old and I know I've worked with General Mikolaities on the State not having to have a match, especially during the COVID environment, but it's absolutely critical and this really goes back to the climate.

If you look at how inefficient so many of our facilities are and everything that we build new or replace, we make sure it's modernized and it's more efficient, so it reduces the energy to offer those.

But also if you look at the armories, these were built in the '50s and '60s and back then, an infantryman could put everything in a wall locker and that's not the case anymore. There's significant equipment requirements and security requirements.

So any additional funding we can get, we always put to good use.

Senator SHAHEEN. Thank you. Do you want to add to that, General?

General DANIELS. We're in a very similar situation. We're funded at about 86 percent of our requirements and we continue to do the best we can with the resources that we've got and we continue to look for modernization and efficiencies wherever possible.

Senator SHAHEEN. Thank you both.

Mr. Chairman, I know I'm out of time, but I would suggest that as we're thinking about any infrastructure package, thinking about how we can support our Guard around the country would be an important piece of that.

Thank you all.

Senator TESTER. Senator Hoeven.

Senator HOEVEN. Thank you, Mr. Chairman.

General Hokanson, thank you for visiting with me earlier, appreciate it, and I want to begin by talking about the MQ-1C Gray Eagle. That's important equipment for Active Duty Army. As a matter of fact, the Gray Eagle, they operate all across of their combat aviation brigades, and so given that the Army National Guard is expected to deploy and fight alongside the Active Duty counterparts, it seems to me it would be very important that you have the Gray Eagle, as well, for your soldiers and that you are trained on it, and so I would ask your opinion and do you support fielding the MQ-1C Gray Eagle for the Army National Guard?

General HOKANSON. Yes, sir, and we look at the Army National Guard divisions. So there's 10 Active Duty divisions and we're now forming eight National Guard divisions and that capability currently resides in the combat aviation brigades on Active Duty.

I want to make sure that our National Guard is equipped and looks just like the Active component and so if they have Gray Eagles in their combat aviation brigades, I would strongly advocate for the same capability within the National Guard so that our units are interoperable and we have the same capabilities in each of our divisions.

Senator HOEVEN. So what steps need to be taken to accomplish that?

General HOKANSON. Sir, I believe the Army would need to be resourced because, as we brought the eight additional Guard divisions on, those capabilities, like DFARS (Defense Acquisition Regulations System) and other organizations, are being stood up in the National Guard right now, so that we have the same and look the same.

Senator HOEVEN. Also, I want to ask about the MQ-9 Reaper. Our Air Guard flies that, the Happy Hooligans, in Fargo, and they were one of the very first Guard units to get that mission, originally Predator, now Reaper, and they've been flying it continuously ever since.

We're building a new operations facility which is good, but we're flying the Block 1 MQ-9, and we need to get to the Block 5, and so we worked to authorize and fund 16 of the new aircraft for this fiscal year. We'll continue to work to do that, but I would like, you know, your assurances that for Guard units like ours that they will transition in a timely way from the Block 1 to the Block 5.

General HOKANSON. Yes, sir, and I believe they're scheduled to convert in 2024, about the same time as the facilities will be completed, and obviously, sir, if there's any opportunity to speed up, we'll work with the Air Force to do that, but I know Currently the plan is in fiscal year 2024.

Senator HOEVEN. Appreciate that. My next, I guess, question relates to tuition assistance. A huge tool for recruiting and retention for the Guard and all Reserve units is making sure that the educational benefit is there, both the Federal tuition assistance and the G.I. Bill educational benefit, and I have put in legislation with Senator Pat Leahy to make sure that the Guard and all Reserve components can use both because you need it for recruitment to get these—I mean, your business is a high-tech business that calls for certainly capable people physically but they have to be super sharp now in terms of using all the technology, you know, to stay ahead of our adversaries. So our legislation would make sure that all Guard and all Reserve components could use both.

Now good news is that the DOD has said yes, we're going to do that. So tell me where are we in getting that done and getting it out to our soldiers, our men and women in uniform.

General HOKANSON. Yes, sir. So within the Army National Guard, we've got it out and we've had that capability previously.

Within the Air National Guard, we've had to fund that and currently we have 14 States that are doing that, but based on the success of that program, we are now funding within the Air National Guard eight additional States every year until we get all 54, but, sir, as you mentioned, it's an incredible benefit to our guardsmen.

Senator HOEVEN. It really is, and I would welcome comments from any of the others on that and the Tricare Reserve Select benefit is something that we have to have out there for Guard and Reserve, as well, starting with you, General Hokanson, and then General Scobee and anyone else that wants to weigh in on either of those, the education or healthcare benefit.

General HOKANSON. Yes, sir. As I mentioned, that's my Number 1 legislation priority. It's a benefit not only just to the medical

readiness of the organization but to the family members and also it's a benefit to the employer knowing that if they employ a guardsman, they have their own healthcare.

Also, we talked about potentially benefits when it comes to suicide prevention by having mental health readily available as well as counseling.

Senator HOEVEN. General Scobee.

General SCOBEE. Senator Hoeven, exactly right. General Hokanson has explained it correctly. What I would really tell you from a Reserve perspective, this is a new benefit that we have on the education piece, and we're very thankful that you started that and that the Department of Defense has followed through with what we wanted for our airmen.

Our airmen now are so much better than they were in the past as far as education, high-tech, and the things that we've been able to do over the last few decades. We really need these benefits because it attracts and retains the airmen that we need.

And then as you talked about, Tricare Reserve Select, we are extremely thankful for that benefit. Right now, it's scheduled to take place in 2030. We'd like to move that up sooner, if able, but the ability for our airmen not to have lapses in coverage is exactly what we've been talking about up here as a group is to ensure that we have all the medical benefits that should be allowed for our members to use, especially when it comes to mental illness or anything that would happen to them and when they are activated.

Thank you.

Senator HOEVEN. I know I'm over my time, Mr. Chairman. Just any other thoughts that—

General SCOBEE. Senator, I'd offer just a slightly different perspective. I think all of these benefits are welcome by all the service chiefs and they're of great use and utility to our force, our future force.

The problem becomes if you look in the lens of future resourcing. Our obligation is to train these young warriors to be prepared for the next fight and if we push all of our resourcing into education and health benefits, which are exceptional, where are we aggregating risk if we're cutting into the resources that we really have to use which is preparing them for war?

There's a fine balance here. If there's one pie to slice from, we have to look at where we're taking those slices from and then consider the actual risk to the human beings that we're trusted to safeguard.

Thank you.

Senator HOEVEN. Appreciate that. Thank you, Mr. Chairman.

Senator TESTER. Senator Baldwin virtually.

Senator BALDWIN. Thank you, Mr. Chairman.

General Hokanson, as we discussed recently, I wrote to the DOD Inspector General late last year concerned that not all Guard members were protected as whistleblowers due to the Inspector General's interpretation of military whistle-blower protection statutes.

The IG (Inspector General) wrote back last month saying that it would begin expanding whistleblower protections to Guard members operating under Title 32 status. This is a welcomed updated,

but I really believe that all members of the Guard should be protected, regardless of duty status.

Further, I do not believe it was Congress's intent in passing military whistleblower protections to have these protections be dependent on a specific duty status instead of simply tied to being a member of the Armed Forces in general.

In Wisconsin, because of brave whistleblowers, the National Guard Bureau's Office of Complex Investigations uncovered a history of reprisal, retaliation, and command-initiated investigations that were out of line with DOD sexual assault prevention policy. We have to ensure that these types of whistleblowers are protected from reprisal.

So can you discuss the importance of ensuring that whistleblower protections include all Guard personnel, and do you support a change in definition of "member of the Armed Forces" that would ensure whistleblower protections for all members of the Guard?

General HOKANSON. Yes, Senator. So when we look at the intent of that policy, our key is to work with the 54 adjutants general and their States to make sure that they follow the intent of that policy unique to their State and so we will look very closely with them and work with the adjutants general as those are the ones that would implement that to make sure that we have a policy that covers all of our Guard members based on their service.

Senator BALDWIN. Thank you. General Hokanson, can you explain a little about how the Office of Complex Investigations works? For example, how are cases assigned, how are investigators trained, and how does OCI (Office of Complex Investigations) decide which sexual assault cases it investigates?

General HOKANSON. Yes, Senator, and thank you for the opportunity to talk about this.

So when we look at our Office of Complex Investigations, because 95 percent of what we do operates in the Title 32 or in the State status, the majority of time we're not under Title 10 and so we rely on our local law enforcement and local prosecutors to address serious events, specifically sexual assault, and in cases where the local law enforcement may not take the case, we have created an administrative review under our Office of Complex Investigation.

In that case, the victim or the adjutant general can ask for the OCI to come into their State and conduct an investigation, administrative, and make recommendations to the chain of command and so what that allows us to do is to take a look at some cases that may not be accepted or may not meet the criteria of local law enforcement and it gives us an avenue to address those issues.

When we look at where we are today, traditionally we had about 18 to 24. Shortly after becoming the Chief of the National Guard Bureau, I reached out to the 54. We were able to get 32 trained investigators right now. We also separated it from our General Counsel and is independently and is now led by a general officer with legal background in a civilian career who General Walker is doing some incredible work making sure that we look at all of the new cases but also the backlogs.

The key is we're trying to get the older ones done as quickly as possible so that we can get current and reduce the timeframe from

when it's reported until that adjutant general receives a completed report.

Senator BALDWIN. Does the Office of Complex Investigations have enough investigators to investigate every case sent to it from the States at the current staffing level?

General HOKANSON. Senator, we could always use more resources. For us, it's finding qualified personnel across the organization that have the time to do this or could leave their civilian career to do this. So we could obviously always use more, but it's a fine line between that and those capable to do it that are volunteering to do it.

Senator BALDWIN. Yes. How many investigators would the Office of Complex Investigations need to keep current and what funding or other assistance from Congress could help you get there?

General HOKANSON. So, Senator, I know we have 32 today and General Walker recently came onboard. He's doing a complete review of the entire organization. So if you don't mind, I would prefer to get back to you directly from him because I know he's looking at the caseload and the number of folks he would need and the exact resources.

Senator BALDWIN. I appreciate that and will look forward to that information.

Let me add on to that. What would the National Guard Bureau require in order to have the Office of Complex Investigations do, say, top-down reviews for each Guard unit on a rotational basis or as a matter of routine in order to ensure that their sexual assault policies are in line with Federal law?

General HOKANSON. Yes, Senator, I'll defer to General Walker and I'll get his specifics there, but I know this is something that we work with our 54 adjutants general to make sure that they're following the policies directed by each of the services and that they meet those requirements and that we review them to make sure that they have the personnel assigned to the areas where they're supposed to be and also to make sure they're trained and one thing this has brought up is the availability of school seats.

Also, the unique environment the national guardsmen operate in since 95 percent of our time is in a Title 32 status and so we're actually right now exploring the potential of creating our own schoolhouse to really take the best of what the Army and the Air Force does but also train to the unique environment the National Guard operates in.

Senator TESTER. Thank you, Senator Baldwin.

Senator BALDWIN. Appreciate that. Thank you, Mr. Chairman.

Senator TESTER. Yes. Thank you, Senator Baldwin.

Senator BOOZMAN.

Senator BOOZMAN. Thank you, Mr. Chairman, and thank you all for being here.

I also want to echo the great job that the Guard and Reserve did during COVID. Just last week, the Arkansas National Guard concluded its 13-month mission to help distribute roughly 56 million pieces of PPE (Personal Protective Equipment) to our communities and medical facilities. I think that just illustrates what went on all over the country. So be sure and pat yourselves on the back and all of those that have worked so, so very hard.

Lieutenant General Daniels, I enjoyed our recent conversation hearing about your efforts to recruit and retain soldiers. The Army Reserve contains a significant amount of the Army's medical capabilities with many of your soldiers having civilian careers in various medical fields.

Can you walk us through your efforts with the Urban Augmentation Medical Task Forces and the role they are designed to play in combating COVID-19?

General DANIELS. Thank you, Senator.

We took a paper that had been written and within 48 hours created these Urban Augmentation Medical Task Forces of 85 medical professionals and within 2 weeks were then putting them up into the Northeast cities and places where those hospitals were under great stress to help provide some relief.

We were very careful and cautious where we pulled these individuals from so they were not hurting their local communities but were in a place that they could go and provide assistance to others.

We deployed 15 of those very early on and then later during the COVID response, we put another three out to the West Coast and we had another four on standby.

Senator BOOZMAN. Now that's a great story and in normal times that 48 hours would take months and months and months, maybe years. So thank you for your leadership and again, you know, making things happen.

General Hokanson, in your written testimony, you spoke about providing the necessary forces to meet Joint Force mission. You mentioned several Guard units that deploy overseas and the extensive training that is necessary for them to go. Locations, such as Fort Chaffee in Arkansas, have the capabilities to provide first-class alternate locations for units to train to meet the growing demand of Joint Force.

I guess the question is can you comment on the current readiness of the National Guard and do you have the necessary capacity needed to train those forces?

General HOKANSON. Yes, Senator. So when we look at the current readiness, even despite the COVID environment, we met every single one of our overseas deployment requirements and also we met every requirement from our Governors.

However, that did have an impact on us, particularly when you look at recruiting, the inability to meet face to face like we previously had, has caused a lot of innovative ways to get recruiting and retention and also training.

Now you train virtually and now we're to the point where, you know, with maintaining social distancing and all the other requirements, we're able to continue our training and also, in fact, it was the National Guard's 34th Armored Brigade Combat Team was the first one to go through a combat training center rotation in a COVID environment.

But, sir, aside from that, when we look at Fort Chaffee and a lot of our other training areas, it's absolutely critical that we maintain those so that we have the ability to train our guardsmen within their States or nearby because the amount of training space that we have and ranges is continually getting encroached upon.

Senator BOOZMAN. Right.

General HOKANSON. So it's important for us to retain every single one of those.

Senator BOOZMAN. Very good. General, in your written testimony you stated, "The National Guard is a lethal, cost-effective, dual-role operational force that provides strategic depth to the Army, Air Force, and Space Force, and responds to crisis in our homeland. Some estimates put that cost effectiveness of the Guard at 30 cents on the dollar."

Knowing that, would you say that the Guard funding request from the services have been adequate over the years, and then also how critical is the National Guard and Reserve equipment account funding to the continued operations of the Guard, particularly in domestic missions supporting the homeland?

General HOKANSON. So, sir, related to the last question with NGRE, the equipment account, it's absolutely critical to the modernization of the National Guard and I think all of our Reserve components.

Our services don't always have enough funding to modernize the entire organization and so that allows us to help supplement that, but also when we look at a lot of the critical dual-use capabilities, like I'll just use fire buckets as an example to fight forest fires, that allows us to do that, to purchase that equipment and maintain it in case our communities ever need it.

Senator BOOZMAN. Very good. Thank you, Mr. Chairman.

Senator TESTER. Thank you, Senator Boozman.

ADDITIONAL COMMITTEE QUESTIONS

We appreciate all your testimony here today. Senators may submit additional written questions and we ask you, if you receive those, to respond to those in a reasonable period of time.

[The following questions were not asked at the hearing, but were submitted to the Department for response subsequent to the hearing:]

QUESTIONS SUBMITTED TO GENERAL DANIEL R. HOKANSON

QUESTIONS SUBMITTED BY SENATOR PATRICK LEAHY

Question. For each of the previous three fiscal years, I have supported additional funding through the appropriations process for a National Guard preventative mental health program executed by the Office of Warrior Resiliency and Fitness. Evidence shows that building resiliency in individuals before they experience stressful events enhances their ability to avoid or recover from post-traumatic stress. An essential part of the concept is to use data and analysis to build tailored prevention programs for behavioral health by state, region, and even individual.

What is your assessment of the progress made towards establishing a preventative program?

Answer. In November 2018, NGB published CNGBI 0300.01 to establish a Warrior Resilience and Fitness (WRF) Program, which created a framework to integrate prevention efforts across the States, Territories, and DC. In July 2019, NGB formally created the WRF Office which is organized under the J1 Directorate. There are currently three lines of effort including Innovation and Outreach, Program Implementation, and Prevention Integration. In 2019, NGB developed the Warrior Resilience and Fitness "Innovation Incubator" (WRFII) initiative which selects and pilots innovative State-level best practices that aim to enhance the readiness, wellness, and resilience of geographically dispersed members of the NG. We currently have 27 pilot programs being reviewed for broader implementation at State or National level. In addition, WRF is currently evaluating Secretary of Defense Immediate Action #3 (Establishing a Prevention Workforce) to analyze status, gaps, requirements, and opportunities of the National Guard prevention workforce.

Question. How often do you meet directly with the head of the program or other behavioral health specialists involved in the program on progress towards achieving the program's goals especially those related to developing analytic tools and tailored behavioral health training?

Answer. I have met with RADM Matthew Kleiman, the Chief of Warrior Resiliency and Fitness, on multiple occasions over the past year to discuss mental health resources, suicide prevention strategies, and the development of analytic tools to support the resiliency of the force. Additionally, RADM Kleiman leads our Suicide Prevention Task Force and in this role meets with the Vice Chief of the National Guard Bureau, Lt Gen Sasseville, approximately twice a month, and more as needed, to provide updates on our prevention efforts.

Question. What is the progress in providing analytic tools to help commanders tailor preventative programs for greater effectiveness?

Answer. NGB has partnered with the Office of the Secretary of Defense to leverage the Advana system to create a predictive analytics dashboard (SPRINGboard) that uses external social determinants of health data and internal DoD metrics to capture geographic risk and protective factors across the National Guard. Using machine learning, this tool can help analyze probable health outcomes and provide data-informed decisionmaking to leaders at all levels.

In June 2020, we began disseminating this tool to Behavioral Health leaders across the States, Territories, and District of Columbia. We are continuing to disseminate and expect this tool will be fully disseminated by December 2021. Of note, full implementation of the tool is dependent on a data-sharing agreement to get full access to Department of Defense data for National Guard members. By December 2021, we expect the data-sharing agreement to be in place.

Question. In what fiscal year do you anticipate programming for this critical function?

Answer. We requested programmed funding for WRF beginning in fiscal year 2023. I have included this program as a funding priority in the fiscal year 2023 funding priorities memorandum to the Secretary of Defense, Secretary of the Army, and Secretary of the Air Force.

Question. Since 2019, members of the National Guard have been called upon to perform more missions that at any time since the Second World War, many of them domestically, such as supporting local officials in coronavirus response and supporting local response to civil disturbances.

What is the amount and status of reimbursement for funds spent related to activities of members of the National Guard on orders pursuant to 32 USC 502(f)?

Answer. To date, Federal Emergency Management Agency (FEMA) issued reimbursable funding authority to the National Guard totals \$4.5B. Current obligations total over \$2.9B with \$1.6B billed. Ongoing reconciliation of funds received with obligations will result in bills or return of funding to FEMA.

In support of Capitol Response, the National Guard has obligated \$520.9M (\$450 million Army National Guard and \$71 million Air National Guard) from current year National Guard appropriations. To date, the National Guard has not received reimbursement for these expenditures and if the National Guard Bureau does not receive confirmation funds will be reimbursed by July 15, 2021, the National Guard Bureau must take fiscally prudent steps to prevent an Anti-Deficiency Act violation. These steps will include notifying the Adjutants General to cancel August and September Inactive Duty for Training (IDT) and all remaining Annual Trainings effective August 1, 2021.

Question. What is your assessment of improvements that could be made under policy or law to more smoothly place members of the National Guard on orders pursuant to 32 USC 502(f)?

Answer. Duty Status Reform would prove extremely helpful to smoothly place members of the National Guard on orders pursuant to 32 USC 502(f) and other reserve component mobilization authorities. The Administration is working with the Department of Defense to streamline mobilization authorities and potentially change benefits associated with mobilization authorities. The intent of Duty Status Reform is to enhance readiness with less disruptions to Service member pay and benefits. The earliest time that the Administration will provide Congress with a Reserve Duty Status proposal for consideration will be before the development of the fiscal year 2023 National Defense Authorization Act.

Question. In early 2020, I asked General Joseph Lengyel, then Chief of the National Guard Bureau, about items that would have been purchased to respond to a pandemic, if the National Guard Reserve and Equipment funds had not been transferred to pay for a border wall in the southwest.

What equipment and resources gaps currently exist that may curtail the Guard's ability to respond to pandemics or other public health crises?

Answer. The National Guard has not identified any resource gaps that may curtail the ability to respond to a public health crises. However, the National Guard did identify certain equipment gaps during the 2020 pandemic response. Equipment gaps included shortages of thermometers, hand sanitizer, and Personal Protective Equipment (PPE such as masks, gloves, and eye protection).

Since there is not a National Guard stockpile of PPE for a pandemic or disaster response, all on-hand stocks are limited in quantity and designed to support complex domestic chemical or radiological responses. The expectation is that all PPE requirements will be provided by the supported state, Federal agency or facility.

Question. What lessons have been learned about equipment needs for responding to pandemics or other public health crises?

Answer. There were several lessons learned about pandemic or other public health crises equipment needs, including M50 gas mask limitations, PPE for non-healthcare workers, and disinfection of respirators. The U.S. Army Medical Command, Office of The Surgeon General and NGB published guidance recommending M50s only as a last resort option for COVID-19 response, which also requires co-ordination through chain of command/designated POCs. Unit commanders and medical personnel need to be cognizant of the limitations of M50s when making PPE or disease spread control recommendations. For example, the M50 mask does not filter exhaled air.

Units should reference the DoD Force Health Protection Supp 7, CDC, and OSHA guidance. The Air Force Surgeon General has engaged in conversations specifically regarding PPE for Law Enforcement (LE) activities with known or suspected COVID-19 positive individuals. A small percentage of Security Forces Squadron (SFS) and some Office of Special Investigations operations include law enforcement activities. Close contact is primarily anticipated during arrests, booking, finger printing and DNA swabbing. It is recommended that law enforcement activities in SFS be granted access to elective use N95s. As it is difficult for the SFS community to determine when a particular defender may engage in LE activities, the enhanced PPE including N95s may be staged with first aid kits and leveraged when necessary.

The disinfection procedures for elastomeric full/half face respirators and powered air-purifying respirators following potential COVID-19 exposure and after common mask fit testing, should be conducted according to manufacturer recommendations using an EPA approved disinfectant. Masks should be immersed and cleaned with soap and disinfectant. Respirator wipes are not recommended.

QUESTIONS SUBMITTED BY SENATOR SUSAN M. COLLINS

Question. You said in your written testimony that the National Guard's State Partnership Program (SPP) "is a key pillar to the Department of Defense's focus on alliances and partnerships." That is absolutely correct. The Maine National Guard's longstanding partnership with Montenegro is an excellent example of SPP building capable, trusted, and interoperable military partners. The Maine Guard's work with Montenegro was crucial to the country's accession into NATO in 2017.

What are your top priorities for the State Partnership Program in fiscal year 22?

Answer. Thank you for your question regarding the State Partnership Program (SPP) and my priorities for the future of this critical program. Since the SPP started in 1993, all events and engagements have been designed to enhance the national security of the United States by building relationships with our Partner Nations.

I have four priorities for SPP. First, normalizing funding will enable NGB to more deliberately plan SPP training events and engagements, which would help strengthen existing alliances and partnerships through greater stabilization and predictability of funding. Second, NGB is working closely with OSD and the GCCs to build a strategic and deliberate process to best pair state National Guards with future partner nations. Third, it is important that NGB be able to provide a Bilateral Affairs Officer for each partnership due to their critical role in building and maintaining strong relationships with the partner nation and Embassy teams. Lastly, I'm prioritizing efforts to 'professionalize' our SPP force through our outstanding relationship with the Defense Security Cooperation Agency. This emphasis ensures the SPP workforce is trained and certified for their positions.

Question. The Maine Guard is currently seeking to partner with a new nation—the African Island nation Cabo Verde. I think this would be a great partnership, and many state and local institutions in Maine, including the University of Maine, have signed on to support the effort and provide their own unique knowledge. I wanted to highlight my support.

When do you expect a decision to be made?

Answer. The State Partnership Program pairing process is highly deliberative. After a comprehensive analysis and review with all stakeholders and the States, Territories, and the District of Columbia, NGB will send its recommendation to OSD by the end of August 2021.

QUESTIONS SUBMITTED BY SENATOR ROY BLUNT

THE 2-152 INFANTRY BATTALION TRANSFER FROM THE INDIANA NATIONAL GUARD TO THE MISSOURI NATIONAL GUARD

Question. General Hokanson, I, along with others of the Missouri Congressional Delegation, wrote to you last month to express our support for your decision to re-station the 2nd Battalion, 152nd Infantry Regiment with its 700 excellent National Guard men and women to the Missouri National Guard.

Once the execution timeline has been determined, we look forward to supporting the National Guard Bureau and the Missouri TAG, Major General Cumpton, to ensure this transfer is seamless and successful.

As you know the Missouri Army National Guard is well positioned to assume and incorporate this great and storied unit.

Also, I want to say thanks and look forward to continue working with you to complete the AVCRAD Phase 3B and 4 projects in Springfield, Missouri.

Please let us know if there is anything you need to support these two efforts. Answer Question 1:

Answer. Thank you for your support, we look forward to the opportunity to build an additional infantry battalion in Missouri and to continue efforts to improve Army aviation maintenance support provided in Springfield. General Cumpton has a great plan to incorporate these additional combat and aviation support capabilities into the Missouri Army National Guard.

THE ROLE OF C-130S

Question. General Hokanson, I would like to note my continued concerns about the Air Force's proposed reductions of C-130 Total Aircraft Inventory.

My understanding is that Air Force seeks to cut five flying squadrons as part of an effort to reduce the number of C-130s to approximately 255 planes over the next 5 years, with the majority of reduction coming from the Air National Guard.

I know a number of Senators, including many members of this committee, have articulated the detrimental impact of reducing our national airlift capacity.

Furthermore, the targeted reduction of Air National Guard C-130s would make it difficult—if not impossible—for the Guard to support routine training missions, as well as domestic operations to respond to emergencies and disasters.

If any proposed reductions come from within the Guard C-130 force structure, there will be a significant loss of domestic operations capabilities. As we have seen over the last several years, those domestic requirements are not letting up.

Please provide your perspective on the breadth and depth regarding the role our C-130s play in supporting the requirements of domestic operations.

Answer. Air National Guard (ANG) C-130s play an important part in supporting domestic operations. Since 2017, ANG C-130s have conducted 50 percent of all ANG airlift supporting domestic operations while simultaneously executing Federal operational requirements. These domestic operations include hurricanes Harvey, Irma, and Maria as well as responding to civil unrest operations in 2020 and Operation Capital Response (2021). Specifically regarding Operation Capitol Response, ANG C-130s flew 352 sorties, which transported 5,197 personnel and 481 tons of cargo. The ANG C-130s also constitutes 75 percent of all national wildland aerial firefighting capability with the Modular Airborne Fire Fighting System supporting the National Interagency Fire Center.

The Mobility Capability Requirements Study (MCRS) for NDAA 2020 is currently being conducted by United States Transportation Command. The MCRS will evaluate current operational plans to determine a level of intra-theater airlift required to balance force structure with operational risk. The ANG is awaiting the MCRS out-brief to determine the total force intra-theater airlift requirement for the Federal operational taskings. If a force structure reduction is recommended, the ANG wishes to discuss which component(s) will shoulder the reduction, given the dual role operations levied upon ANG C-130s for both Federal and domestic support.

THE FUTURE C-130 FORCE STRUCTURE AND THE 139TH AIRLIFT WING AT ROSECRANS AIR
NATIONAL GUARD BASE

Question. General Hokanson, while the Air Force and Air National Guard have indicated that there will be no reduction of C-130H aircraft at the 139th Airlift Wing at Rosecrans Air National Guard Base, I expressed in a letter last month to General Charles Brown, and Lieutenant General Michael Loh—and I want to express to you—my concerns should any optional course of action be considered.

As you know, the 139th Airlift Wing supports both the C-130 Weapons Instructor Course and the Advanced Airlift Tactics Training Center. The Air National Guard acknowledged that two C-130s at Rosecrans supporting the Weapons Instructor Course mission were improperly coded as Backup Aircraft Inventory. If the 139th were to lose one of these aircraft, it would lose its ability to conduct these unique and necessary training missions that support the broader Air Force enterprise.

I would appreciate your commitment to ensuring the Air National Guard correctly recodes these aircraft, and confirming your commitment to preserving the vital mission of the 139th Air Wing mission.

Answer. The men and women of the 139th Airlift Wing (AW) make significant contributions to the tactical airlift mission and our Nation's defense. We understand your interest in preserving the C-130H aircraft currently based in Missouri.

We recognize the challenges the 139 AW faces as host to the C-130H Weapons Instructor Course (WIC) and Advanced Airlift Tactics Training Center (AATTC). The 139 AW has the appropriate resources to execute these missions while continuing to perform its operational mission and meet the training needs of assigned aircrew. The Program Change Request (PCR) mentioned is being coordinated through standard Air Force procedures and will be considered once all applicable stakeholders have had a chance to provide input.

We value all ANG C-130 units and, as such, use objective, analytical data when making force structure decisions. We intend to retain ANG C-130H/J tactical airlift aircraft that contribute to missions, including Defense Support to Civil Authorities and other domestic operations. The ANG has a plan to meet the fiscal year 2021 force reduction by divesting aircraft from the C-130H Formal Training Unit (FTU). The 139 AW is not impacted by these fiscal year 2021 force structure reductions.

The Department faces a number of tough choices each budget cycle. Our data-driven analysis seeks to balance risk across the Total Force and our core missions, grounded in guidance defined by the National Defense Strategy. Divestment of legacy C-130H aircraft will allow investment in new tactical airlift capabilities to meet demands posed by the future spectrum of conflict and will enable the Joint Force to project combat power into highly-contested environments.

QUESTIONS SUBMITTED TO LIEUTENANT GENERAL RICHARD W. SCOBEE

QUESTIONS SUBMITTED BY SENATOR ROY BLUNT

THE ENDURING MISSION OF THE A-10 AND THE 442ND FIGHTER WING AT WHITEMAN AIR
FORCE BASE

Question. Lieutenant General Scobee, Senator Kelly and I recently introduced a resolution in support and recognition of the A-10. I'm pleased that we have made great progress with the support of this committee to ensure our aircraft at the 442nd Fighter Wing and across the A-10 enterprise are modernized.

The 442nd is an incredible source of fighter pilot experience in close air support and search and rescue, in addition to enjoying access to air space and training ranges, first-class facilities, and lack of encroachment at Whiteman Air Force Base.

As we look into the out-years, I look forward to working with you to position the 442nd for an enduring mission beyond the operational life expectancy of the A-10. Please let us know if there is anything you need to support this effort.

Answer. The A-10 remains a valuable asset for close air support and I thank you for your continued advocacy to ensure these aircraft remain combat effective.

While acquiring new platforms will enhance our capabilities, the Air Force Reserve will continue to rely on many of the proven platforms currently in our inventory such as the A-10. This necessitates aircraft modernization and system upgrades, which will provide the capabilities needed for the future fight and ensure survivability if operating in a contested environment.

Necessary A-10 enhancements include the installation of upgraded mission computers, Helmet-Mounted Targeting, Anti-Jam Global Positioning System equipment, and missile warning systems, which will provide enhanced threat awareness and weapons delivery capabilities in contested environments.

In 2022, the Department of the Air Force is looking to begin a slight reduction in the A-10 fleet and then reapply the resources, including manpower, to capabilities needed to counter future peer threats. However, this decrease will not impact the Air Force Reserve's A-10s and the Department of the Air Force is committed to extending the A-10's service life on our retained aircraft.

When it comes to modernization and equipment parity, the funding provided by Congress via the National Guard and Reserve Equipment Appropriation is vital. NGREA enables us to modernize equipment, sustain our capability, and replace obsolete equipment to maintain parity with the Active Component when recapitalization is not feasible. Parity is critical to seamless Total Force Integration. We remain grateful for these appropriations, and cannot overemphasize how essential they are to our readiness. I appreciate your support for NGREA now and in the future.

I wholeheartedly agree with your assessment of the 442nd, they are a premier source of combat-ready Airmen and I am extremely proud of the work they do every day in defense of our Nation. The Air Force Reserve looks forward to maintaining our presence at Whiteman Air Force Base for years to come.

SUBCOMMITTEE RECESS

Senator TESTER. The next Defense Subcommittee will reconvene on Wednesday, May 26, at 10 a.m., for a Closed Hearing on Intelligence Committee. On the housekeeping front, the hearing after the next one because it will be a closed hearing. So this won't apply.

But we will ask questions on this committee based on seniority and who is physically present. After those questions have been asked, then we'll go off of seniority virtually.

So that's a little change in process, but we've got some direction from the CDC (Centers for Disease Control and Prevention) now that I think will help encourage folks to be here in person.

So with that, thank you all very much, and this committee is adjourned.

[Whereupon, at 11:43 a.m., Tuesday, May 18, the subcommittee was recessed, to reconvene subject to the call of the Chair.]

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 2022

TUESDAY, JUNE 8, 2021

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 2:06 p.m., in room SD-192, Dirksen Senate Office Building, Hon. Jon Tester, (chairman) presiding.

Present: Senators Tester, Durbin, Leahy, Feinstein, Murray, Schatz, Baldwin, Shelby, Murkowski, Moran, Hoeven, and Boozman.

DEPARTMENT OF DEFENSE

DEPARTMENT OF THE AIR FORCE

OFFICE OF THE SECRETARY

STATEMENT OF HON. JOHN P. ROTH, ACTING SECRETARY

OPENING STATEMENT OF SENATOR JON TESTER

Senator TESTER. I want to call the meeting to order. Ranking Member Shelby is on his way, so we will get started.

I just want to start by welcoming our witnesses, folks that have been in service to this country for a long, long time. Acting Secretary John Roth has over 40 years of service to this Nation as a Department of Defense civilian. With a background in budgeting and financial management, his background makes him an ideal witness for this hearing today.

General Charles Brown is the Chief of Staff of the Air Force. His record as a pilot and commander is exceptional, and I might add, he also makes an outstanding travel companion. General, I want to thank you for visiting Malmstrom Air Force Base and the Montana Air National Guard a few weeks ago.

And I just have a question I want you to address in your opening statement, and that is what does the "Q" in "C.Q. Brown" stand for?

[Laughter.]

Senator TESTER. Other than that, it is good.

And finally, General John W. Raymond, Chief of Space Operations, welcome. General Raymond has over 30 years career in the space positions and is our Nation's first leader of Space Force. This is the subcommittee's first hearing with General Raymond, and I look forward to hearing your assessment of Space Force and where it stands today.

The Air Force and Space Force are meeting the challenges of near peer competition with other nations with an aggressive modernization program. With new, continued investments in updated platforms like the F-15EX, new platforms like the B-21 bomber, and leaping ahead with new space capabilities, our witnesses are clearly focused on preparing to deter and, if necessary, fight the wars of tomorrow. But we are also in a time of constrained budgets. To bridge the gap between the resources available and developing new weapons, the Air Force is proposing to retire legacy systems.

When military leaders tell me that they believe spending money on something is no longer a good idea, I take that very seriously. But I also know that new weapons rarely deliver on time and on budget. This subcommittee needs to ask the question of whether the Air Force is rolling the dice with a strategy of retiring airplanes in favor of systems still on the drawing board or if some of those bets may be better than others.

I just want to close by saying I want to thank the witnesses ahead for the testimony they are about to give, and I look forward to hearing from each one of them. And I think we will start with the witness testimony.

Hang on here. Okay, Mr. Roth, you may start.

SUMMARY STATEMENT OF HON. JOHN P. ROTH

Secretary ROTH. Thank you very much, Chairman. Thank you, Chairman Tester. Thank you, Chairman Leahy.

Members of the committee, it is a pleasure to be here today. I am also honored to have General Brown and General Raymond join me in representing the nearly 700,000 airmen and guardians that defend our Nation. We are thankful for your consistent and persistent support over the years, which has enabled us to build the world's greatest air and space forces.

As an integrated force, our airmen and guardians stand ready, willing, and able to meet responsibilities to our Nation and continue defending the high ground. From 300 feet to 300 miles off the ground, we protect the homeland, we project power, and we defend democracy.

The long-term strategic competition with China and Russia demands we focus on capabilities we need today to win tomorrow. Our Nation's competitive strategic advantage relies on air and space superiority, which is underpinned by rapid technological advancement and the extension of space as a warfighting domain.

In line with Secretary Austin's priorities to defend the Nation, take care of our people, and succeed through teamwork, our fiscal year 2022 budget is the beginning of a journey to the Air and Space Forces of 2030. It builds the capabilities that allow the Department to modernize while continuing to meet the national security objectives and defend the high ground.

Specifically, we are committed to investing in, one, empowering airmen and guardians; two, capability-focused modernization; three, connecting us to the Joint Force; and four, expanding partnerships.

First, our airmen and guardians remain the heart of our ability to deter and, if necessary, defeat our competitors. We are trans-

forming our talent management systems to ensure we develop and train leaders with the competence, character, and skills required to win high-end fights. And we remain devoted to recruiting and retaining a diverse core of multi-capable, innovative talent to out-manuever our adversaries today and in the future.

We owe it to our force to provide them with an environment where all can thrive. That is why we are directing critical resources to rid our ranks of any corrosive elements and injustices that degrade our ability to provide a lethal, ready force.

Second, to remain the world's greatest air and space force, we must look to the future through a lens of capability-based modernization. Evidenced by nuclear modernization and next-generation air dominance platforms, our digital acquisition approach revolutionizes how we design and field capabilities to the warfighters.

Moving forward, we will expand on these digital revolutions while also investing in next-generation space systems that are resilient and defensive. Space is no longer a benign domain. Our U.S. Space Force was purpose-built to deter and protect free access to space.

Third, combatant commanders require an agile military that operates seamlessly across all domains at both speed and scale. That is why we continue to invest in capabilities like the Advanced Battle Management System, our contribution to Joint All-Domain Command and Control, which will connect every sensor to every shooter across all domains.

Likewise, access to and freedom of action in space is central to connecting us to the Joint Force. In its second year, the U.S. Space Force is laser-focused on integration. Investments in space capabilities increase the effectiveness of operations across all domains. The result is a U.S. military that is better connected, better informed, faster, and more precise.

Finally, the U.S. Air and Space Forces do not fight alone. We benefit from the expertise and capabilities of our sister services and coalition forces, as well as the whole of government, commercial industry, and academia. We will continue to invest in enduring relationships while expanding new partnerships to transfer how we fight future wars.

Members of the committee, thank you for inviting us to testify. I look forward to your support and am confident that with your help, the Air and Space Forces will be armed with the capabilities necessary to protect our Nation and defend the high ground. We welcome your questions, and I ask that this opening statement be entered into the record.

Thank you.

Senator TESTER. And it will be, and thank you, Secretary Roth.

Senator Shelby, do you have anything you would like to say before we move to General Brown?

Senator SHELBY. I just have an opening statement I would like to place in the record.

Senator TESTER. Without objection, so done.

[The statement follows:]

PREPARED STATEMENT OF SENATOR RICHARD C. SHELBY

Thank you Mr. Chairman.

Secretary Roth, General Brown, and General Raymond, welcome.

Thank you for being here today to present your budget for fiscal year 2022, and to provide this committee with an update on the challenges that you face.

Our nation expects that our military is ready and capable to deter our adversaries and defend the homeland.

Not only do our adversaries pose new and increasing threats that erode our traditional technological advantages, but the age of some of our most important weapon systems require that we make investments today.

We must continue to maintain a credible nuclear deterrent, while at the same time developing hypersonic weapons and ensuring that our aircraft can meet the challenges posed by China and Russia.

I am also interested to hear more from you about how this budget request recognizes the contributions of the Space Force, and the growing importance of operations in space.

The National Security Space Launch program has been a good investment of taxpayer dollars, and I encourage the Department of Defense and Intelligence Community to continue to use the Space Force launch enterprise for National Security Space Launch-class missions.

Given that the overall funding request for the Department of Defense does not keep pace with inflation, I am concerned that we are sending the wrong message to both our allies and our adversaries.

I look forward to hearing how your fiscal year 2022 budget request balances all of these important priorities, thank you.

Senator TESTER. Thank you, Senator Shelby.

General Brown.

**STATEMENT OF GENERAL CHARLES Q. BROWN, JR., CHIEF OF STAFF,
UNITED STATES AIR FORCE**

General BROWN. Good afternoon, Chairman Tester, Chairman Leahy, Ranking Member Shelby, and distinguished members of this committee.

I am humbled to serve as our Nation's 22nd Air Force Chief of Staff and represent the 689,000 total force airmen serving today. Your support to our airmen and their families is greatly appreciated.

It is an honor to appear before you today with Acting Secretary Roth and my fellow service chief and friend of many years, General Raymond. As a general officer, I have spent the last decade plus in joint positions overseas and/or supporting operations in the Middle East, Europe, Africa, and most recently the Indo-Pacific. With this context, I have been able to look at the Air Force from varying perspectives, and I have personally seen a reemergence of great power competition and how the character of war has changed.

The strategic environment has rapidly evolved, and we haven't changed fast enough to keep pace. The People's Republic of China has recognized modern warfare as a contest among systems, not individual units or platforms. Accordingly, Secretary Austin has prioritized China as our pacing threat.

Meanwhile, Russia continues to modernize its armed forces, increasing the capability of its missiles, strike aircraft, warships, artillery systems, and nuclear weapons. And competition and future warfare will be conducted across all domains simultaneously. It will be transregional and a global undertaking with complex actions and actors intertwined.

To account for these changes, our Nation, our Air Force must change faster than we have been. If we continue on the path of in-

cremental change, our advantage erodes, and losing becomes a distinct possibility.

The Air Force recently updated our mission statement “to fly, fight, and win—airpower anytime, anywhere.” To keep this mission now and into future, we must transition our Air Force and our operational concepts from today to tomorrow, and we must do so faster.

That is why I wrote “Accelerate Change or Lose” to call attention to the changes in the strategic environment because the mix of capabilities that our Air Force has now that were good enough for yesterday, that are good enough for today, will fail tomorrow. Our future Air Force must be agile, resilient, and connected, with the ability to generate near instantaneous effects anytime, anywhere. Not just sometime and some places, but anytime, anywhere.

Our Air Force is the only service that provides our joint teammates and our allies and partners the assurance of air superiority, the advantage of global strike, and the agility of rapid global mobility through a range of capabilities most requested by today’s combatant commanders. Additionally, the Air Force’s ISR (Intelligence, Surveillance, and Reconnaissance) and command and control capabilities provide the ability to sense, make sense, and act.

But while our past and current capabilities have sufficed for the last three decades, they will not effectively perform in tomorrow’s highly contested environment. To address the challenges that will endanger our national security tomorrow, the transition to the future Air Force design must start today.

Finally, we have a financial responsibility to our airmen and their families. I remain focused on ensuring we are ready and that we have the tools, infrastructure, and talent management systems to provide the environment where all can reach their full potential. The future Air Force design advances our core missions and new approaches to warfighting that holistically support every combatant commander and benefit every service chief. Investing in your Air Force is an investment in the Joint Force.

Ladies and gentlemen, the bottom line is simple. We must modernize for the future and focus on capabilities that maintain our advantage both today and tomorrow.

For decades, we have collaborated with Congress and our industry partners to modernize for the future. Now to fulfill our responsibility to ensure our national security, we must be willing to change, to make the tough choices required to deliberately transform our Air Force to the future force we need to compete, deter, and win. We have done it before, and I am confident together we can do it again.

Thank you for the opportunity to be with you today, and before I close, I would like to answer Chairman Tester’s question. The “Q” stands for “Quinton.”

I look forward to taking your additional questions throughout the rest of the hearing.

Senator TESTER. That is a good answer because I just won five bucks off my staff.

[Laughter.]

Senator TESTER. General—thank you, General Brown.

General Raymond.

STATEMENT OF GENERAL JOHN W. RAYMOND, CHIEF OF SPACE OPERATIONS, UNITED STATES SPACE FORCE

General RAYMOND. Chairman Tester, Chairman Leahy, Ranking Member Shelby, and distinguished members of this committee, it is an honor to appear before you for the first time and to do so alongside Secretary Roth, the Acting Secretary of the Air Force, and General C.Q. Brown, Chief of Staff of the Air Force, a longtime friend and a longtime teammate.

On behalf of the guardians that are stationed worldwide, let me begin by thanking you for the continued leadership and strong support that you have provided to the Space Force.

The United States is a space-faring Nation. We have long understood that our Nation is strongest economically, diplomatically, and militarily when we have access to and freedom to maneuver in space. For the past three decades, we have been able to take that access and that freedom to maneuver for granted.

Unfortunately, as the National Defense Strategy and the newer Interim National Security Strategy identified, this is no longer the case. Both China, our pacing threat, and Russia continue to develop two things. First, they are developing space capabilities for their own use. So they have that same advantage that we have. And secondly, they are building weapons systems specifically designed to deny our space-enabled advantages that America currently enjoys.

These threats that they are developing include robust jamming of our GPS satellite constellation and communication satellites; directed energy systems that can blind, disrupt, or damage our satellites; anti-satellite weapons in space that are purpose-built to destroy U.S. satellites; and cyber capabilities that can deny our access to the domain. Thankfully, with the strong support of Congress, the United States seized on the opportunity to make needed changes to stay ahead of the growing threat by establishing the United States Space Force.

This leadership is resonating globally and is already delivering results for our Nation. We have slashed bureaucracy at every level in order to empower our guardians to move at speed and to increase accountability necessary to successfully operate in this domain.

We have put together a very forward-leaning human capital strategy, allowing us to build a more highly trained, educated, and developed warfighting force while taking care of guardians and their families throughout their entire career. We wrote our first doctrine to clearly articulate the independent value of space power to joint and coalition forces, and this importance is fully captured in the Department's new joint warfighting construct that is being developed.

Our international partnerships are stronger, with many of our partner nations following our lead and elevating space inside of their militaries. We have created a new end-to-end capability development process from force design and requirements to acquisition and testing, enabled by a digital thread to move at speed while driving unity of effort across the Department of Defense. We have rejected stovepipes by actively working with the Joint Force and

other Government agencies and industry to compete, deter, and win at an affordable cost.

The Space Force cannot and will not tolerate business as usual. Our demanding mission and lean force demand nothing less than a new standard of efficiency. The budget reflects the shift of many Department of Defense space activities into the Space Force, yet we remain about 2.5 percent of the overall Department of Defense budget.

We are committed to stretching every dollar to its limit to buy as much capability as possible for our Nation. This fiscal year, the 2022 budget balances the need to protect capabilities we have on orbit now while shifting and modernizing to a more defensible architecture in the future. It is an investment that provides assured space capabilities to our sister services, our Nation, and to our coalition warfighting partners.

These demanding tasks could not have been possible without sustained support from Congress, including this committee, and for that, I thank you. We cannot afford to lose space.

I am absolutely honored and humbled to serve as the first Chief of Space Operations and to have the opportunity to serve side by side with the incredible guardians that I am privileged to lead. It is because of them that our Nation enjoys the benefits of space today, and it is because of them, America's sons and daughters, that we will compete, deter, and win in the future.

I really look forward to your questions. Thanks for the opportunity.

[The statement follows:]

PREPARED STATEMENT OF HON. JOHN P. ROTH, GENERAL CHARLES Q. BROWN, JR.
AND GENERAL JOHN W. RAYMOND

THE DEPARTMENT OF THE AIR FORCE

The Air and Space Forces unite under the Department of the Air Force and are inextricably linked in defense of the crucial high ground, integral to the stability of the global security landscape. Under civilian leadership, the Department's nearly 700,000 Airmen and Guardians provide independent and integrated options to national leaders while defending democracy, an ideal that President Biden said, "holds the key to freedom, prosperity, peace, and dignity." The Department of the Air Force enhances the peaceful instruments of diplomacy, sustains instruments of deterrence that check the spread of conflict, and ensures credible consequences for aggression.

Today more than ever, we and our national security partners must be bold. The challenges are many: the People's Republic of China, the Russian Federation, contested domains old and new, the vulnerabilities of proliferated technology and weapons, climate change, a global pandemic and its aftermath, the accumulated results of past budget priorities and decisions, and corrosive, difficult human issues like extremism, sexual assault/harassment, suicide, and disparate treatment of others. We must think and act differently. We no longer have the luxury of time to evolve into what we need to be...we must harness this unique moment together taking action to change. We simply cannot maintain status quo.

Given China's exponential pace of weapons development and extensive marshaling of government and industry, we do not have the leeway to simply maintain our current approach. China is on track to exceed our capacity, so it is our obligation to act with a sense of urgency. China poses challenges unlike any other in our Nation's history. We must be clear-eyed about these threats and our response to them. We recognize the need for change AND must create the capacity for that change. We must substantially improve our understanding of China and the Indo-Pacific region and prioritize the threats accordingly. We cannot afford to keep prioritizing near-term operational posture and today's force structure at the expense of modernization and investment.

This Department is particularly suited for these challenges. We own the high ground with air and space today, but it becomes more contested every day. We cannot allow the erosion of our advantages in this crucial high ground in competition now or in a future conflict. The speed, reach, and responsiveness of the U.S. Air Force and U.S. Space Force reinforce all instruments of national power and norms of responsible behavior. We can see, sense, and strike targets near and far, and provide global warning, networks, and independent options in space. We provide global strike and effects that can hold any target at risk within 24 hours—this is not conceptual or theoretical, it is reality. Global strike requires a unique fusion of intelligence, surveillance, reconnaissance, logistics, access, and speed that only the Air and Space Forces provide at a moment's notice. Our ability to rapidly eliminate threats anywhere in the world is a consequence of our inherent global persistence and reach, not necessarily dependent upon pre-positioning or forward basing. We have been exceptional at this, and until now we have also been unmatched.

The Department of the Air Force requires a modernized force that is relevant today and long into the future. We are hard at work designing our future force. We must invest in the cutting-edge technologies and capabilities that are critical to securing our military advantage in the future—this includes updating our two legs of the Nation's nuclear triad, and our nuclear command, control, and communications systems. Enabling our military advantage in the long term means we need to shift away from legacy platforms and weapons systems that are decreasing in relevance today and will be irrelevant in the future—our aircraft fleet is 30 years old on average, and 44% are beyond their designed service life. Maintaining our aging weapon systems is costly now and, without change, will mortgage our future. We must also create decision superiority by delivering information and capabilities to decision makers at all echelons through a “military internet of things.” A critical step includes accelerating command and control infrastructure by investing in the Advanced Battle Management System (ABMS)—a vital contribution by the Department of the Air Force to Joint All-Domain Command and Control. We must methodically and immediately move out on tough decisions in order to compete.

Similarly, we must revise the Space Force's force design to be resilient against a significantly increasing threat. We must continue to innovate, adapt and diversify capabilities to meet the threats that challenge America's access and maneuverability in space and that of our allies and partners. As we advance space defense, we must simultaneously work with stakeholders across the Department of Defense, the whole-of-government, our allies and partners, and commercial industry to integrate and streamline space power efforts. Only then will America be able to fully leverage what we have built over the last year.

The Air Force and Space Force have been on the leading edge of technology since their inception. By embracing novel authorities such as middle-tier of acquisition authorities, and innovative approaches such as agile software development, modular open systems approach, and digital engineering, we will stay on the cutting edge. We intend to capitalize on future investments in modeling and synthetic simulation environments to ensure both joint warfighters and operational platforms are ready.

As outlined in the Interim National Security Strategic Guidance, we are “committed to realizing and defending the democratic values at the heart of the American way of life.” Outpacing threats in tomorrow's complex global security landscape requires innovative thinking and modern investments. We recognize the need for change in order to protect the American way of life. This budget lays out a plan to modernize our military capabilities, and will allow U.S. diplomats to negotiate from a position of strength.

EMPOWERED AIRMEN & GUARDIANS

America's Airmen and Guardians conduct combat operations, channel innovation, and conquer adversity around the globe all day, every day. We know that Airmen and Guardians are our greatest and most precious resource. While weapons systems and tactics inevitably change, our Airmen and Guardians remain the core of our ability to deter and, if necessary, defeat our competitors. We need multi-capable professionals who bring diverse ideas, leverage digital tools, and outmaneuver and out think our adversaries. Our Airmen and Guardians have committed to service and taken oaths pledging their lives to the protection of our Constitution. And while we are working to provide the best environment possible as we recruit, train, retain, and leverage our strategic advantage—our people.

As a Department, we are working to increase diversity and inclusion, build and fortify resiliency, support our families, and develop empowered Airmen and Guardians. We must ensure a culture of dignity and respect. We must ensure our people have both high quality of service and high quality of life. This starts with ensuring

Air Force and Space Force leaders represent the Nation and our Core Values. Our Nation's defenders must be empowered, resilient, agile, innovative, well-led and clear on how much they are valued.

Diversity

A diverse and inclusive force is a warfighting imperative. The Department of the Air Force must attract, recruit, and retain talented Americans from all backgrounds to leverage diverse ideas and experiences. By harnessing Airmen's and Guardians' diverse experiences, geographic and socioeconomic backgrounds, cultural knowledge, and language abilities, we possess an asymmetric advantage over our competitors.

To sustain our lethality and credibility, our force must be truly inclusive and reflect the best of the diverse society we serve. This includes removing barriers to service—from reviewing our accession and assessment tools and career development, to expanding outreach to underrepresented minorities through diversity recruiting and increasing scholarships at minority-serving institutions. It will also include modernizing how we develop Airmen and Guardians, transforming our personnel and talent management systems, and championing a culture of support and inclusion for all Airmen, Guardians, and their families.

Sexual Assault Prevention and Response

Sexual assault is a crime that undermines force lethality, readiness, and mission success. The Department of the Air Force is committed to eradicating sexual assault using effective, research-based prevention. These efforts utilize assessment tools to identify those at high risk for unethical behavior, equip all leaders with information and goals to reduce assault risk factors, educate the force on intervention skills, and promote positive unit culture to eradicate sexual assault. When sexual assault does occur, the Department is dedicated to supporting victims and prosecuting those who would harm others through the chain of command and Uniform Code of Military Justice.

Suicide and Personal Violence Prevention

The prevention of suicide and interpersonal violence remains a difficult challenge. To reduce the incidence of suicide, the Department of the Air Force is undertaking a leadership-driven public-health approach informed by data and analysis while partnering with academia, industry, and our sister Services to include diverse ideas and perspectives.

The Department of the Air Force is also committed to eliminating interpersonal violence in any form. Domestic violence, child maltreatment, workplace violence, and sexual assault negatively impact victims, families, units, mission effectiveness, and the Department as a whole. We are dedicated to a strategy that leverages the latest science, implements best practices, and incorporates feedback from our members. Should these acts of violence occur despite our prevention efforts, we are committed to providing victims the necessary care and holding perpetrators accountable.

Quality of Life

We owe our Airmen and Guardians the best quality of life possible. We must continue work to improve all the professional and personal aspects of life for each of our Airmen and Guardians, and their families. It includes professional development, housing, child care programs, healthcare, education, and spousal employment, among many others. We are integrating the availability of quality housing, health care, occupational licensing reciprocity, and school caliber into our strategic basing criteria—ensuring our families have the best support possible. The Department is committed to continuing these worthy efforts. Our Airmen and Guardians deserve nothing less.

A DEPARTMENT OF THE AIR FORCE FOR 2030

As the Department of Air Force prepares to celebrate 75 years of service to our great Nation, the Air Force is transforming itself to address the challenges of near-peer adversaries while the newest branch of the U.S. Armed Forces—the Space Force—is creating and integrating a Service purposely built to compete, deter, and win in the space domain. Both Services, and the entire Department of the Air Force, are dedicated to protecting the Homeland and democracy around the globe. We must modernize and integrate to meet the challenges posed by great power competition, climate change, cybersecurity, fiscal constraints, and worldwide pandemics. With Congress's support, we will maintain our dominance of the high ground, and we will ensure the American way of life for generations to come.

UNITED STATES AIR FORCE

VISION FOR CHANGE—AMERICA'S AIR FORCE FOR 2030

America fights as a joint team, and the U.S. Air Force is the only Service that can meet our Nation's adversaries with mass, speed, agility and survivability on near-immediate timelines. The Air Force sees, senses, and communicates globally. The Air Force monitors our adversaries' movements, deploys forces enmasse, deters competitors, and strikes enemies without warning. No one else can do it. Without the Air Force, the joint force loses. Only with a modernized and ready Air Force is the joint team—and our Nation—secure.

The American homeland is no longer a sanctuary. Our citizens face threats from a variety of actors in both the physical and digital arenas. Competitors, especially the China and Russia, continue aggressive efforts to negate our long-standing warfighting advantages while challenging America's interests and geopolitical position. While the Nation was focused on countering violent extremist organizations, great power competitors focused on the American way of war. They studied, resourced, and introduced systems specifically designed to defeat Air Force capabilities that have strengthened the joint force for a generation. That is why the Air Force must accelerate change now, so we can protect the American way of life in 2030 and for decades to come. Simply put, if we do not change, we risk losing. We risk losing in great power competition, we risk losing in a high-end fight, and we risk losing quality Airmen and families.

The President clearly stated that diplomacy is our primary means of engaging with the world; it must be our first tool of choice. The President likewise recognizes that our decisions and actions must come from a position of strength. The Air Force offers safe, secure, and effective nuclear deterrence, which strengthens national policies. It is also important to recognize that air dominance is not an American birthright. The Air Force is pivotal to deterring these aggressors and bolstering our allies and partners. America remains committed to freedom of the commons to support maintaining the rules-based international order around the globe. Control of the air and enabling domains ensures that the joint force has full freedom of maneuver. The diversity of our Airmen is both a tactical and strategic advantage. We are committed to recruiting and retaining the best of America. While the COVID-19 pandemic provided new challenges to our force, we remain devoted to caring for Airmen. Suicide and sexual assault persist as challenges that we are tackling head-on. Likewise family support programs are vital to our resiliency as a Service. A diverse and inclusive Air Force helps us out-innovate adversaries today and overcome challenges tomorrow. And, we know that each Airman—active duty, Guard, Reserve, and civilian, no matter their background—took an oath to defend the Nation for all Americans.

Airmen in the near future are more likely to fight in highly-contested environments. These complex, all-domain conflicts will result in combat attrition rates and risks to the Homeland that are more akin to World War II than the uncontested environments to which we have become accustomed. Given our ability to project power from afar, independent of forward access or lengthy prepositioning timelines, Airmen will be the first to respond to many emerging crises. In any scenario, the Air Force plays a unique and integral role to our collective deterrence and joint warfighting credibility. We must accelerate change to meet the challenges our Nation faces. This requires a relevant, modern force based on cutting-edge capabilities that will survive in future conflicts and shifting away from legacy platforms that are increasingly irrelevant.

The Air Force is expected to provide enduring airpower capabilities irrespective of the threat encountered, the technology utilized, or the budget provided. The core missions of airpower—air superiority; global strike; rapid global mobility; command and control; and intelligence, surveillance, and reconnaissance—provide unequivocal advantage to the joint force. Only the Air Force provides air superiority, global strike, and rapid global mobility for the Nation. Without these missions, the Homeland is unprotected and America cannot project power around the globe. We are innovating and advancing our competencies with innovative capabilities such as the Advanced Battle Management System, which will increase commanders' decision advantage. Moreover, new approaches to our core missions enhance the joint force and answer the challenges posed by great power competitors.

The Air Force's future force design recognizes the need for change and the range of threats to the Nation, our allies, and partners. In 2021, we identified three key capability development areas for investment: connect the joint force, generate combat power, and conduct logistics under attack. Moving forward we will prioritize the resources that will allow us to continue to make investments in these areas, with

more to come. Additionally, the Air Force will prioritize within its resources, affordable, analytically defensible, force structure and system capability proposals. Through partnership with Congress, the Air Force will prioritize resources to guard the foundations of national freedom and independence for America and our allies.

AIR SUPERIORITY

Combat power, regardless of Service, often depends on the Air Force's ability to deliver air superiority. Our competitors have fielded air forces, radar systems, and missiles that can attack our territory, bases, forces, and allies and partners, or defend against our military actions. Our job is to stop them through control of the air. To do this, we build understanding of the air situation and then use the right mix of capability and capacity to control the air while creating windows of air superiority—no matter the threat. As we stay ahead of our competitors, the Air Force needs flexible systems and agile design processes to field new capabilities at speed.

Current platforms will not fully support tomorrow's demands. Airmen are deliberately balancing today's readiness risk with capability modernization. Remaining ahead of adversaries who are committed to negating our technological edge requires investment in advanced capabilities. Likewise, access to domestic airspace allows us to train in realistic environments, which is essential to developing and maintaining these advanced capabilities. Near-peer competitors are challenging our capability to command the air. We must take action now to ensure the joint force's success tomorrow.

Future Air Superiority Capability

The F-35 Joint Strike Fighter is the cornerstone of our future fighter force and air superiority. Achieving air superiority in a future fight is strongly dependent on full-spectrum dominance. The F-35 and its 5th-generation capabilities are part of our fighter force design that outpaces key competitors. The Air Force is fully committed to the F-35 and needs it to be capable, available, and affordable. As we continue to receive the F-35 into the Air Force and increase our capability, it is important to manage our F-35 fleet in an intelligent and deliberate way to ensure we remain ready to deter adversaries, support our international allies and partners, and meet our Nation's security commitments worldwide.

The Air Force cannot successfully fight tomorrow's conflicts with yesterday's weapons. Our adversaries recognize that full-spectrum dominance is a national strength. As a direct result, competitors are investing to overtake our current warfighting advantage in the air. Next Generation Air Dominance (NGAD) ensures we maintain air superiority in the future by introducing game-changing technology that includes digital engineering, open mission systems architecture, and agile software. NGAD is not a single platform—it is a capability focused on fielding capabilities to mitigate identified capability gaps, not on creating a "next-generation" aircraft. The capabilities NGAD provides will ensure survivability, lethality, and persistence while seamlessly integrating with the Advanced Battle Management System via a mix of manned, unmanned, and even optionally-manned aircraft along with advanced stand-off weapons.

We will complement NGAD and currently fielded 5th-generation fighters such as the F-22 and F-35 with the F-15EX. Acquiring this re-designed aircraft allows us to shore up our fighter force while driving down sustainment costs, our fleet's average age, and inherent risk. By leveraging our partners' investments in the F-15 platform, the Air Force is efficiently fielding a familiar aircraft with proven tactics. It also boasts an open mission software system, which allows us to easily update the computer and avionics software.

GLOBAL STRIKE

Global strike is critical to our national power and an enduring airpower capability. Regardless of the aircraft, weapon, or system employed, we must maintain the capability to attack at a time and place of our choosing. As China and Russia develop new weapons and defenses, we must modernize and develop capabilities to maintain a competitive advantage. Both nuclear and conventional strike must be integrated to compete against these near-peer adversaries. Air Force strike operations are precise, and these effects are delivered through standoff capabilities as well as penetrating platforms.

Nuclear deterrence allows the Nation to negotiate from a position of power. A credible, capable, and safe nuclear deterrent provides the United States and our allies with an umbrella of protection while discouraging the use of nuclear weapons by all nations. Likewise, a strong nuclear strike capability deters conflict.

For precise, conventional attack capabilities to succeed, they must be capable of penetrating highly-contested environments. To maintain our advantage, the Air Force requires capabilities that incorporate domain awareness, full-spectrum survivability, extended range, and sufficient payload. It is vital that our capabilities keep pace as threats evolve. By leveraging human-machine learning, the right mix of manned and unmanned systems, and agile design processes, our global strike capabilities will provide responsiveness, precision, flexibility, connectedness, and integration across the joint force.

The United States Air Force has the unique ability to sense, see, and strike any target, anywhere, at any time, nearly instantaneously, from anywhere in the world. On a daily basis, one aspect of these capabilities is on full display as our bomber task forces execute training scenarios with our allies and partners. It is no secret that potential adversaries closely monitor global activity—these maneuvers make adversaries think twice about conducting malign activities while reassuring our allies and partners.

The Air Force's global strike capabilities have the range, speed, and flexibility required in a conflict and are far less as dependent on pre-positioning or forward-basing. A continued investment in modernization efforts to our bomber and tanker fleets will ensure our long-range capability for the future. Additionally, a renewed emphasis into air base defense, along with Agile Combat Employment and Joint All-Domain Command and Control concepts will ensure the United States maintains the world's greatest military asymmetric advantage well into the future.

Ground Based Strategic Deterrent (GBSD)

The Nation requires a fully modernized nuclear triad and supporting infrastructure to maintain our nuclear deterrence capability. Deterrence operates in peacetime, through the gray zone, worldwide, across all domains, and into conflict. And, deterrence requires all three legs for a responsive nuclear triad. By not maintaining a reliable U.S. Intercontinental Ballistic Missile (ICBM) force, we risk deterrence erosion against not one, but two strategic nuclear adversaries. This is too high of a risk to our Nation's security.

Our ICBMs have provided a highly reliable and secure deterrent capability since 1959. Delaying their modernization for the last two decades necessitates a comprehensive weapon replacement.

The Ground Based Strategic Deterrent (GBSD), the ICBM replacement, capitalizes on the strengths of a land-based triad component that is survivable, efficient, and geographically dispersed, while replacing aging components and addressing asset attrition along with the ICBM force's declining infrastructure.

B-21 Raider

Our bomber force constitutes the second critical leg of our Nation's nuclear triad and the B-21 Raider aircraft will be the backbone of our future bomber force. The B-21 will possess the range, access, and payload to penetrate the most highly-contested threat environments and hold any target around the globe at risk. This new bomber will provide the capabilities to deter and, if needed, win in high-end, near-peer conflicts. And with bombers as the most flexible leg of the nuclear triad, the B-21 underscores our national security. This aircraft will support combatant commanders across the range of military operations as both a nuclear and conventional bomber.

Over the past three years, the B-21 program accelerated from design to physical manufacturing of aircraft. While building test aircraft, the program is scaling manufacturing infrastructure and capacity across the industrial supply base. In parallel, B-21 beddown preparations continue on-track to support the Nation's newest bomber aircraft projected arrival in the mid-2020s.

Long-Range Standoff Weapon (LRSO)

The Air Launched Cruise Missile is nearly 30 years beyond its intended design life and faces evolving threats and availability challenges. Recapitalization of these missiles via the Long-Range Standoff Weapon (LRSO) is vital to our nuclear deterrence capability.

As our competitors improve their air defense systems, our stand-off delivery capability diminishes. In order to maximize our capabilities, the Nation requires a modernized bomber fleet and the LRSO. This weapon's ability to penetrate contested airspace and survive adversaries' defenses holds targets at risk and is a cost-effective way to modernize the nuclear triad. Additionally, bombers armed with LRSO provide a recallable and re-targetable capability which can hold any target at risk—it is both a visible and tailorable deterrent.

Hypersonics

The Air Force is also investing heavily in hypersonic weapons. This cutting-edge technology increases the Nation's rapid strike capabilities. By leveraging hypersonic weapons' improved maneuverability, America will have additional response options to deter adversaries and reassure allies. An operational hypersonic air-launched weapon enables the United States to hold fixed, high-value, and time-sensitive targets at risk in contested environments from stand-off distances. To that end, the Air Force is developing the Air Launched Rapid Response Weapon (ARRW) using the middle tier of acquisition rapid prototyping authority. ARRW is on track to be the Nation's first operational hypersonic weapon. Hypersonics—and global strike as a whole—enable diplomacy by strengthening the negotiating position of the United States.

RAPID GLOBAL MOBILITY

The Air Force capability that most directly, and physically, supports both the Air Force and our joint teammates is rapid global mobility. Airmen conduct Rapid Global Mobility operations to project and sustain combat power by moving personnel, material, fuel, and supplies across the globe, in and through permissive and contested threat environments on short timelines. The combination of speed, range, flexibility, and responsiveness is what differentiates air mobility operations from other forms of transport and is critical to multi-modal operations contributing to a higher pace for Joint All-Domain Operations. As threats evolve and the United States can no longer operate from well-established fixed bases, rapid global mobility is the lynchpin to persistent logistics, and we are examining unique ways to utilize mobility aircraft.

Air Refueling

Air refueling, one segment of rapid global mobility, is foundational to worldwide power projection. The ability to extend the range and persistence of air platforms provides a decisive advantage and deterrent against adversaries. To maintain our air refueling edge, the Air Force must continue investment in the KC-46 while moving beyond legacy KC-10 and KC-135 aircraft. The inability to phase the divestiture of the legacy tanker fleet shackles funding and manpower resources and hampers the fielding of the more capable KC-46 at the rate required to support combatant commanders. This negatively impacts air refueling capacity and tanker advancement. Offsets from legacy tanker divestment in both funding and manpower are critical to the success of the KC-46 and air refueling as a whole.

Emerging Logistics

Every 4.2 minutes a mobility aircraft takes off from an airfield somewhere in the world. This is a unique opportunity as mobility aircraft are envisioned as critical nodes in the Advanced Battle Management System framework. Mobility platforms of all types can act as sensor nodes, inputting information into the sensing grid and increasing a commander's decision advantage. At the same time, we are exploring novel approaches to logistics through Agility Prime, which is developing electric vertical takeoff-and-landing vehicles (eVTOL). This innovative program will help us rapidly move small numbers of personnel and equipment around a battlefield and quickly rise to respond to emerging challenges such as isolated Service members. We are also training Airmen and developing concepts and practices that allow for dispersed, defensible, and mobile logistics networks. We are establishing agreements with allies and partners that provide access, and the ability to expand access, to key aerial ports, seaports, storage nodes, and associated connections.

Command and Control (C2)

Inherent to out thinking adversaries is the ability to command and control (C2) the joint force. Combatant commanders require an agile military that operates seamlessly across domain boundaries at both speed and scale. The Air Force's current C2 structure is based on a Cold War-era design that is vulnerable and slow—a roadblock to the goal of rapid and agile decision making. The enemy can easily target our C2 structure's centralized nodes with both kinetic and non-kinetic means. C2 must be resilient to attack, responsive to rapid changes, integrated across all domains, and secure from exploitation. This core mission allows the joint force to create an advantage by converging units and capabilities at a time and place of our choosing.

Achieving decision advantage for combatant commanders requires both sensors to gather data and a C2 network to translate and share data across the joint force. Real-time dissemination of actionable information, aided by artificial intelligence and machine learning, allows joint warfighting across all domains at a pace faster

than our competitors. This speed matters to the decision maker and the warfighter. And, with the proliferation of technology, future warfighters will have the ability to observe, orient, decide and act within minutes—as opposed to hours and days.

Advanced Battle Management System (ABMS)

A critical step towards accelerating command and control architecture is the Advanced Battle Management System (ABMS)—the Department of the Air Force’s contribution to Joint All-Domain Command and Control. As a new approach towards information sharing and decision management, ABMS enables compressed decision making and converging effects without domain or geographic boundaries. As a family of capabilities—versus a single system—ABMS creates a digital environment capable of increasing awareness, creating greater understanding, and enabling superior decision making—all of which is critical to prevailing in future conflicts.

As a simple analogy, ABMS strengthens decisions by channeling necessary information and capabilities through a “military internet of things.” This internet, designed with digital standards, is being purpose-built to deliver critical capabilities to the joint force including secure processing, connectivity, data management, applications, sensor integration, and effects integration. ABMS helps overcome the Cold War-roadblock of vulnerable command and control nodes. For instance, by transforming from a small number of air operations centers to a “military internet of things,” ABMS allows for agile, distributed, and mobile capabilities able to execute mission command even when fractured by an enemy attack.

ABMS’s infrastructure is critical to ensuring the joint force connects sensors to shooters with machine- to-machine precision and speed while increasing commanders’ awareness. And just like the development of the internet, ABMS is being built across multiple fiscal years. FY20 and FY21 have focused on exploring how we can best connect sensors and shooters while building partnerships with our industry partners. Moving forward, the Air Force will prioritize resources to allow the continued building of ABMS’s digital network environment and infrastructure. By prioritizing the resources to support ABMS investment, the Air Force will be able to initiate replacement of human-in-the-loop data transfer processes with machine-to-machine data exchanges allowing for delivery of multi-domain secure processing and data management, connectivity, and applications that synchronize sensors and networks. In turn, the joint force is enabled to make decisions faster than the adversary is able to respond.

Nuclear Command, Control, and Communications (NC3)

Nuclear Command, Control, and Communications (NC3) systems act as the central nervous system of our nuclear deterrent. They link the President and national leaders to the nuclear force—all day, every day, under all conditions, without fail. Without NC3, we cannot effectively command and control nuclear forces. And without effective command and control of nuclear forces, we cannot deter adversaries.

Previously, electromagnetic pulses posed the greatest challenge to our NC3 networks. Now, electronic warfare, cyber-attack, and threats from space all provide challenges to key nodes and systems. Russia, while embracing a doctrine of nuclear escalation in conventional conflict, is nearly complete with its recent full range of nuclear modernization efforts. Equally concerning is China’s pursuit of new nuclear capabilities tailored to achieve its national security objectives while also modernizing its conventional military.

As we modernize our portion of the nuclear triad, we must also modernize our NC3. The Air Force is pursuing communication capability enhancements with respect to our bomber force and Ground Based Strategic Deterrent so they will be fully integrated into our current NC3 systems and has flexibility to adapt as NC3 systems are modernized. Moreover, we understand that the strategic environment evolves and is increasingly dynamic. Our NC3 architectures and modernization plans will be adaptable, look beyond the near-term, and integrate with the Advanced Battle Management System (ABMS). While ABMS will enable conventional forces, it will also enable nuclear forces with rapid, multi-path transmissions that will transform NC3 from a Cold War-era relic into a C2 network operating at speeds our adversaries cannot match.

Successfully executing command and control across the joint force requires information. A major avenue for that information is the Air Force’s intelligence, surveillance, and reconnaissance capabilities.

INTELLIGENCE, SURVEILLANCE, AND RECONNAISSANCE (ISR)

The Air Force conducts intelligence, surveillance, and reconnaissance (ISR) missions to analyze, inform, and provide joint force commanders with the knowledge needed to achieve decision advantage. This ISR sensing grid consists of a robust

multi-layered network of sensors, platforms, people, devices, and services with the goal of delivering a holistic, accurate, predictive, and timely characterization of the operating environment. This network is interoperable with the joint force, the intelligence community, allies, and partners. Domain awareness is underpinned by automation, connectivity and analysis; is rooted in intelligence; and is critical to the future of warfare. In that future, ISR underpins the Advanced Battle Management System (ABMS) architecture and allows joint force commanders to achieve an accurate, real-time understanding of the environment. This understanding accelerates decision making, effectively conducts command and control, and achieves decision advantage ahead of competitors.

Future ISR capabilities must be survivable against high-end threats while leveraging forward-looking investments in command and control capabilities—including emerging technology like artificial intelligence—to present decision-ready information faster than our adversaries' capabilities. The Air Force's current ISR systems are viable in a counter-insurgency war, but may not effectively contribute in tomorrow's competitive environment. Without investment in additional capabilities necessary for the high-endfight, we will be reliant on ISR platforms that will be ineffective in highly-contested and denied environments. As a result, we risk fighting blind.

Survivable, Relevant Platforms

ISR platforms play a critical and continuous role in supporting a range of military operations. The most important role of intelligence in military operations is to provide analysis of key aspects of the operating environment to facilitate timely military decisions. Current ISR platforms have been able to accomplish this task with relative ease because they operated in uncontested and low-threat environments where the United States enjoys superiority across all domains of warfare. Such freedom of action will not be the case in the future. Future threats will challenge the ability of legacy ISR platforms to successfully execute their missions.

In the near future, ISR platforms will feed critical data through the Advanced Battle Management System (ABMS), which in turn will present near real-time information to joint force decision makers. Future airborne ISR platforms will need to survive and operate in a more challenging environment. Ongoing modernization efforts will focus on a family of platforms that are effective, resilient, and survivable against technologically—advanced threats, and able to pass data to necessary networks at machine speed. In our discussions going forward, we will steer away from platform—centric conversations and focus instead on the capabilities needed to inform joint force operations.

Our adversaries are already fielding technologies that will hold our legacy platforms at risk to support the range of military operations in a future high-end fight, and the technological evolution will continue to accelerate. In order to keep pace ahead of emerging threats, we must work with the combatant commands to assess the demand signal on current fleets and where acceptable risk can be taken so the Air Force can accelerate modernization. Legacy ISR platforms, once considered irreplaceable to operations, are often unable to survive or deliver needed capabilities on competition-relevant timelines. These legacy platforms must be phased out, with resources used to invest in modern and relevant systems. Working together, we must take calculated risk now in order to reduce the greater future risk.

For instance, the RQ-4 Block 30 Global Hawk was crucial to the ISR requirements of yesterday and today. However, this platform cannot compete in a contested environment. And tomorrow's conflicts will be contested. Moving beyond this platform allows us to bring the ISR enterprise into the digital-age by using sensing grids and fielding advanced technology that includes penetrating ISR platforms. The Air Force will continue to pursue the FY21 NDAA RQ-4 Block 30 divestment waiver in order to repurpose the RQ-4 Block 30 funds for penetrating ISR capability. Overall, intelligence collection will transition to a family of systems that includes non-traditional assets, sensors in all domains, commercial platforms, and a hybrid force of 5th- and 6th-generation capabilities.

A comprehensive investment strategy that the Air Force is bringing forward synchronizes divestment of legacy platforms, takes calculated risk in upgrading existing platforms, and introduces the next-generation ISR family of systems that will feed into ABMS.

NEW APPROACHES

The Air Force's core missions encompass both enduring capabilities unique to our Service and some capabilities shared with the joint force. Airmen are rapidly iterating and innovating improvements to all core missions. These new approaches to airpower overcome today's roadblocks and focus on tomorrow's great power chal-

allenges. Both technology and operational concepts benefit from our Airmen's perspectives. Every day, Airmen increase the agility, speed, resilience, and lethality of our contributions to the joint force.

Force Generation Model

The Air Force is also re-examining how we present forces to combatant commanders. The core missions of the Air Force continue to be in constant demand around the world. And because many of the capabilities we provide are exclusive to our Service, our forces have been under strain for two decades. This strain negatively impacts readiness and our ability to modernize.

Preparing for near-peer adversaries, the Air Force is implementing a new force generation model focused on building and sustaining long-term, high-end readiness. Our goal is to more effectively articulate readiness impacts and capacity limits, and instill discipline into the system. Our new, simplified model, realigns the Air Force with the Joint Staff's three phase model, is easily understood by combatant commanders, builds towards sustainable readiness, and balances current operations with the training necessary for future full-spectrum combat operations.

Agile Combat Employment (ACE)

The Advanced Battle Management System (ABMS) not only connects sensors and shooters but also enhances persistent logistics by sensing the threat landscape and material environment. Persistent logistics, with the inherent ability to posture, sense, and respond, is the warfighting answer to the key operational problem of logistics under attack and enables Agile Combat Employment (ACE). ACE is the ability to quickly disperse & cluster forces to a cooperative security location and conduct operations across all domains with minimal disruption, while maintaining operational flexibility. This new method of operating will allow the United States to confuse the enemy and strike at a time and place of our choosing with minimal risk. The ability of ACE to sustain combat operations through persistent logistics has already been validated through multiple exercises across both the Pacific and European theaters.

ACE requires technological advances like ABMS, novel equipment, and innovative Airmen. Our Airmen are tackling ACE, and the larger challenge of persistent logistics, by adapting techniques previously associated with special operators. Our commanders support these efforts by encouraging critical thinking skills and driving decision making to the lowest levels—in many cases our youngest frontline supervisors. These empowered Airmen are innovating new approaches to projecting combat power across the globe.

Base and Critical Infrastructure Defense

The Department's infrastructure defense efforts are currently focused on directed energy research, development, test and evaluation; counter-small UAS; and investments in cruise missile defense. In the coming years, we will steadily increase investment of critical infrastructure defense measures to meet the challenges of the future fight, ACE, and logistics under attack.

As China and Russia develop weapons that challenge our superiority in the air, they are also making strides that hold our bases at risk. While the Air Force will mitigate some risk through persistent logistics, the security of our air bases is essential to conducting combat operations. Like other aspects of combat operations, base defense is inherently joint. And just as the joint force is dependent on the Air Force to execute our core missions, the Air Force must leverage our sister Services for base defense.

If future expeditionary and permanent air bases are not protected from attack, the Air Force will be challenged to conduct combat operations. Without the Air Force's air superiority, the joint force is at risk of attack from the air for the first time since the Korean War. The Air Force acknowledges that this is a joint problem that requires a joint solution, which is why we have allocated experimental funding to explore and develop directed energy and kinetic and non-kinetic base defense options. Looking forward, the Air Force will prioritize resources that will allow it to continue prototyping the ability to detect, track, identify, and mitigate small unmanned aircraft system threats. Proper base defense encompasses significant decisions with far-reaching impacts—we must get this right.

Infrastructure

We project power, generate readiness, test new platforms, train to support joint operations, and provide safe and healthy communities for our families at our bases. As the joint force becomes increasingly dependent on an integrated battle network, installations also serve as key nodes in enabling mission success around the world. The readiness and resiliency of installations is a matter of strategic importance to

ensure the Air Force can always provide combat capability. Changing climate and severe weather events are a continual threat to our installations, and we have seen first-hand the impacts climate and severe weather have on our installations.

The Air Force views installation resilience as the capability of a base to project combat power by protecting against, responding to, and recovering from deliberate, accidental, or naturally occurring events that impede operations. We are taking a deliberate, holistic approach to installation resilience through Department of the Air Force's Installation Energy Strategic Plan. This includes improving the resiliency of our energy, cyber, infrastructure, and response options.

AMERICA'S AIR FORCE FOR 2030

This year we celebrate America's 245th birthday and next year the Air Force celebrates its 75th anniversary. Throughout our history, the Nation prospered because of our willingness to adapt and evolve, to adjust course when the situation dictates. Democracy is not a birthright, and neither is airdominance. And although airpower is our great comparative advantage, tomorrow's competitive environment requires that we accelerate change or lose.

Tomorrow's battlespace will be shaped by human talent, climate change, constricting budgetary resources, and challenges posed by great powers. The Air Force and its core missions stand ready to exploit the air domain, provide nuclear deterrence, and underwrite the national security America expects and requires. By working with Congress, we will protect the Homeland and defend democratic ideals. Moving forward, the Air Force will prioritize its resources so it is able to adapt our equipment, support our Airmen, and bolster our core missions. We must continue to adjust course and overcome situational challenges so America maintains its air-power advantage.

America cannot wait to modernize the Air Force any longer, not one year, one month, or one week. To deter and defeat today's competitors and tomorrow's adversaries, we must re-capitalize our Air Force and we must do it now... the call to accelerate change or lose is not hyperbole—it is a requirement.

UNITED STATES SPACE FORCE

SECURING AN ENDURING ADVANTAGE

The United States is a space-faring nation. We have long understood that our nation is strongest economically, militarily, and diplomatically when we have access to, and freedom to operate in, space. Unfortunately, potential adversaries have taken note of the United States' reliance on space, and this vital national interest can no longer be taken for granted; it must be secured. The rapid advancements of potential adversaries to threaten U.S. freedom of operation in space must be countered with immediate improvements to our space defense architecture and capabilities.

Competitors like China and Russia are challenging America's advantage in space by aggressively developing weapons to deny or destroy U.S. space capabilities in conflict. Both China and Russia have mobile ground-based laser and electronic warfare systems capable of jamming and blinding our satellite systems. China has invested in satellite grappling technologies, like the Shijian-17 satellite's robotic arm, which could be used in future conflicts. Russia has tested an on-orbit system that has released a projectile designed to destroy U.S. satellites in low-Earth orbit.

The United States would prefer that conflict not begin in or extend to space. Our goal is to deter conflict in space from happening and from spilling over into other domains, and the best way to do so is from a position of strength. We are prepared to protect U.S. interests today and we are moving fast to ensure we can deter in the future, but our ability to deter conflict hinges on demonstrating both capability and resolve. Over-classification of existing systems threatens this ability, and we are developing a reveal and conceal strategy to ensure we can compete, deter, and win in this contested domain.

The Space Force was established to protect U.S. investments and freedom of operation in space, provide space capabilities to the Nation, the joint force, sister Services, the intelligence community, and our allies and partners. The Space Force is designed to be lean, agile, and innovative in order to move at speed and compete in the vast domain of space. Our small size also makes us the ideal pathfinder to validate new structures and approaches that can provide benefit across the joint force. While our budget is roughly two percent of the Department of Defense's request, the capabilities we deliver underwrite the force design of the entire joint force. Space capabilities have become a cornerstone of deterrence, not just in space, but in every domain. Without space, our forces abroad, security at home, and allies everywhere are at much greater risk. If we lose in space, America loses.

We spent the first year inventing the Space Force, with an organizational design that reflects the character of our operating environment and the nature of conflict that is likely to manifest. A headquarters and Field Command structure aligns complementary functions and streamlines command authority in the deliberate pursuit of speed and agility. Our first field command, Space Operations Command, stood up in October 2020 as the primary space forces provider to the combatant commands. We will establish the remaining two field commands before the end of 2021: Space Systems Command will develop, acquire, and field operationally relevant and resilient space capabilities in resilient and defensible architectures, and Space Training and Readiness Command will develop tactics, a testing enterprise, doctrine, advanced warfare training, and a dedicated cadre of warfighting professionals. We have already transferred space missions, billets, and monetary resources from 23 Air Force units to the Space Force, and we are preparing to merge operations, acquisition, and sustainment for some space systems currently distributed across the Army, Navy, and the Office of the Secretary of Defense, including the Space Development Agency beginning next year.

In our second year, we are aggressively integrating the Service into the fabric of national and international security by collaborating across the Department of Defense, interagency, commercial industry, and our allies and partners. As the Space Force creates independent military options for decision makers, we are preparing a force presentation model to optimize integration and delivery of space capability to the joint force. We are working to streamline acquisition processes to increase decision speed and expedite capability development, creating an integrated test enterprise, and doing the analytical and developmental work to create the most effective and efficient force design for the domain to bring unity of effort across the department. Lastly, we have initiated planning for a National Space Intelligence Center to provide scientific and technical intelligence as well as foundational space intelligence to the Service and the intelligence community. These initiatives make us more resilient and competitive, and they will put us in a better position to sustain continuing advantage.

DEVELOPING AND CARING FOR GUARDIANS

The character of operations and aspects of potential conflict in space are fundamentally different from the military art of terrestrial domains. Vast distances and speeds, potential for first-mover advantage, and unique operating environment demand experts that are familiar with these physical characteristics. As in all other domains, Guardians must stay ahead of adversaries to give joint commanders and national civilian leadership new space-based security options. This requires a dramatic change in how we attract, recruit, develop, train, and retain talent.

We are committed to ensuring that the Guardians reflect the diverse character of the United States—it is a national security imperative. Diversity gives us the perspective and skills to meet the challenges of our security environment and ensures we can bring our nation's best talent to bear on the hardest problems. In order to meet these goals, we must work hard to address tough issues like sexual assault, extremism, and discrimination within the force; solving these problems is essential to building a Service that ensures talented people of all genders, orientations, races, ethnicities, and beliefs are included and empowered to reach their full potential.

Guardian Strategy

To win the battle for talent, we have created a Human Capital Office to develop a new strategy for unified talent management for all Guardians, in pursuit of an inclusive and team-centric culture. Our small size creates the opportunity and the mandate for a tailored approach to caring for and developing our Guardians from accessions to retirement and beyond.

This "Guardian Strategy" will lead digital enablement by creating a digital cadre, an optimized data infrastructure, increased process automation, and new digital platforms. Using interviews and other assessment tools as well as focusing our Reserve Officer Training Corps presence at select universities will support both diversity efforts and needs for space related research and technical grounding. We look to develop and employ talent by taking a competency-based development approach, mandating more robust feedback systems, and creating potential-based promotion assessments with sequenced talent management boards. In our first year, professional development opportunities and promotion rates have increased significantly; we must reinforce systemic change to make this an enduring effect.

The Space Force is developing its own officer and enlisted professional military education (PME) programs to fit within the broader concepts of the Guardian Strategy to ensure that all members are career-long learners, and that learning directly relates to the success of their current and future duties. Space Force PME will focus on the development of space-minded warfighters who are credible and effective in multi-domain warfare and the joint environment. We have already expanded space curricula at Airman Leadership School; stood up a Space Force Non-Commissioned Officer Leadership Academy; expanded the Schriever Space Scholars Program at Air University; and created the West Fellowship for Senior Developmental Education. Finally, we are taking a proactive approach featuring teams at the unit level to strengthen social, physical, and mental attributes to energize personal and organizational resiliency. As the Space Force takes care of Guardians and their families, it must prepare them to defend our Nation.

Space Force talent must be deliberately managed by well-positioned human resources mission partners in the field commands and headquarters office to support both military and civilian Guardians.

Training and Doctrine

We have completely redesigned our space training and doctrine across all space operations competencies, beginning with publication last year of a foundational doctrine document. Our training has elevated from basic operation of space systems to threat- and target-based advanced space warfare training. Guardian training and doctrine focuses on seven core competency areas, through advanced training and education: orbital warfare, space electromagnetic warfare, space battle management, space access and sustainment, military intelligence, cyber operations, and engineering and acquisition. Our shift in training and doctrine must be complementary to our capabilities and reflect the reality of our current and future missions.

Additionally, Space Training and Readiness Command is bringing together training and doctrine to support our tactics, strategies, and theories of victory.

VALUE OF PARTNERSHIPS

An independent Service focused on space has already provided greatly expanded opportunities for partnerships with civil and commercial space organizations within the United States and with allies and partners around the world. Working through

the Department of Defense, close cooperation with the National Aeronautics and Space Administration and the Department of State has ensured a unified U.S. voice in discussions about responsible behavior in space with foreign governments. Similarly, through the Department of Defense, we continue to work hand in hand with the Department of Commerce on shared interests including space traffic management, positioning, navigation, and timing programs, applications, and efforts to maintain the space industrial base. We are working to expand cooperation with commercial partners using both traditional and innovative development pathways; seeking means for tighter fusion to take advantage of the enthusiasm and energy in the commercial space sector.

Internationally, our partnerships have historically been built around one-way data sharing agreements with a small number of countries. As the proliferation and importance of space capabilities increases around the world, we are fostering greater cooperation with international partners across the board. For example, a hosted payload agreement with the government of Norway will save us more than \$900 million and helped us get capability on orbit two years faster. We are also working with NATO to further integrate space capabilities and knowledge in that alliance, including the stand-up of the first NATO Space Operations Center within NATO Air Command. Cooperation with allies and partners, on both capability development and operations, continues to provide opportunities to decrease cost and increase speed and innovation.

CREATING A DIGITAL SERVICE

Founded in the Information Age, the Space Force was “born digital.” We are harnessing modern era advancements and tools to accelerate innovation and ensure our military advantages in, to, and from space. Under the leadership of the newly established Technology and Innovation Office, the Space Force focuses on partnering with U.S. government, science and technology industries, and academia to build a digital Service to support Space Force missions and business operations.

Digital Headquarters

Leaders at every echelon of the force require access to data and analytics in order to make informed decisions with speed and precision. A new data analytic environment and automation tools will streamline headquarter processes, enable seamless data sharing, increase decision space, and accelerate warfighting outcomes. Digital transformation is occurring in operational readiness, talent management (recruiting and onboarding), programming and budgeting, and capability development. Incapability development, digital models will enhance analyses of alternatives, iterate requirements decomposition, improve cost estimation fidelity, and ultimately accelerate the planning, coordination, and development of optimum solutions to meet critical warfighter needs.

Digital Operations

Commanders and unit-level Guardians are empowered to innovate inside their mission operations, explore novel concepts for space domain awareness, Joint All-Domain Command and Control, collaborate with small business innovators, and align innovation efforts for transition into operations. This effort includes partnerships with the Joint Artificial Intelligence Center, industry, and academia to advance use of artificial intelligence applications and research.

Digital Workforce

Continuous transformation requires digitally-fluent military and civilian Guardians. Therefore, we are funding software-coding training for military and civilian personnel and leveraging Department-wide digital training efforts to improve digital literacy using industry-leading commercial courseware. To achieve the goal of a digital workforce we must cultivate our collective digital acumen, develop an expert cadre of “Supra Coders,” and equip and empower them to apply agile software practices, use artificial intelligence, and data science. Finally, we must place them strategically across the force to unleash their talent and energy toward inventive, innovative solutions in operations and acquisition.

ACCELERATING CAPABILITY DESIGN, DECISION, & DELIVERY

The Space Force must modernize its architecture to survive and execute space power missions in a contested domain and do so at speed. To this end, the Space Force is engaged in an end-to-end transformation of organizations and processes to accelerate delivery of operationally-relevant capabilities. Consistent with our effort to become a “Digital Service,” we will exploit our digital engineering systems as a

backbone to connect multiple processes and accelerate capability development activities from analysis to integration, decision, and acquisition.

Integrated Analysis for Optimal Design

The Space Warfighting Analysis Center (SWAC), currently aligned under the Space Operations Command, is leading analysis, modeling, wargaming, and experimentation to generate new operational concepts and force design options for the Department of Defense. The SWAC integrates domain expertise with unique analytic tools, datasets, and intelligence to develop operational architecture options to fulfill space missions. By driving unity of effort, we reduce cost, duplication of effort, and increase our speed of decision and action.

Digital Engineering to Better Inform Requirements

Rather than static reports, the SWAC's design options are digital models, which enable testing of proposed capabilities through simulation in an environment that accurately reflects fast evolving threats and the space domain. The Space Force Strategy and Resources Office (SRO) integrates SWAC's design options with the appropriate processes to develop Service capability and programmatic options for presentation to the Joint Requirements Oversight Council and Deputy's Management Action Group. The SRO also ensures digital models generate required data artifacts to inform oversight; Planning, Programming, Budgeting, and Execution; and acquisition actions.

Streamlined Governance for Timely Decisions

In order to support the Assistant Secretary of the Air Force for Space Acquisition and Integration, who will eventually have Service Acquisition Executive (SAE) authority and chair the Space Force Acquisition Council (SAC), the Space Force has established a supporting Program Integration Council (PIC). As a collaborative interagency leadership council, the PIC facilitates cooperation and deconfliction between National Security Space Enterprise stakeholders and ensures planning, alignment, execution, delivery, and optimization of capabilities across all space mission areas. Streamlined coordination across the enterprise via the PIC and SAC improves collaboration and better enables timely decisions by the SAE. The Assistance Secretary of the Air Force for Space Acquisition and Integration is an essential element of this approach and we look forward to implementing this congressionally-directed change as quickly as permitted by law.

Consolidated Space Acquisition Enterprise for Agility

Finally, in the summer of 2021 the Space Force will stand up the Space Systems Command (SSC) to provide for cooperation across space acquisition within the Department of the Air Force. Initially comprised of the former Space and Missile Systems Center (SMC) and the Service's launch enterprise, SSC will also have a limited administrative support relationship with the Space Rapid Capabilities Office (SpRCO) and—as of the beginning of FY23, per statute—the Space Development Agency (SDA). By aligning three organizations with a pedigree in traditional acquisition, disruptive acquisition, and commercial acquisition, the Department of the Air Force can access best-of-breed solutions. Because SSC acquirers will receive digital models with traceable requirements, Program Managers and Program Executive Officers will be equipped to make faster, more agile decisions and trades. In addition, the space acquisition enterprise will continue to improve both commercial and allied integration.

MISSILE WARNING AND MISSILE TRACKING

Strategic and theater missile warning and missile tracking capabilities provide indications and warning to protect the homeland, joint forces and allies abroad. The evolution of threats to on-orbit systems force us to re-think both how we protect and defend our strategic assets, and how future strategic capabilities should be designed to mitigate threats. The Space Force is partnering with combatant commands, the Missile Defense Agency, National Reconnaissance Office, and the Space Development Agency to design and build a resilient missile warning architecture for the collective defense of our nation, joint force, and allies.

Next-Generation Overhead Persistent Infrared (OPIR)

We are designing and developing the future architecture for missile warning and missile tracking. Next-Generation Overhead Persistent Infrared (OPIR) will succeed the current Space Based Infrared System (SBIRS) and will provide increased missile warning, missile defense, battlespace awareness, and technical intelligence capabilities with resiliency and defensive features to counter emerging threats.

The ground system for Next-Gen OPIR, also known as Future Operationally Resilient Ground Evolution (FORGE), migrates satellite command and control to the Space Force's Enterprise Ground Services, modernizes Mission Data Processing to implement an open framework, and upgrades Relay Ground Stations to meet United States Space Command's operational requirements. We are using Middle Tier Acquisition authorities to rapidly prototype solutions. This pathfinder approach delivers the first resilient geosynchronous satellite and associated ground system in FY25 and the first polar satellite in FY28.

POSITIONING, NAVIGATION, AND TIMING

The Global Positioning System (GPS) remains the “gold standard” for positioning, navigation, and timing for the United States and the world. GPS underpins the global economy and our way of war. Adversaries have long recognized our dependence on GPS and have proliferated technologies to degrade, deny, and spoof GPS signals for civil and military users. We are pursuing modernization efforts across the entire GPS architecture to include upgrades in space, ground, and user segments. The Space Force's future GPS architecture provides more robust positioning, navigation, and timing to the joint force, ensuring at least one technical generation advantage over any adversary.

GPS Space Segment

The Space Force is pursuing significant satellite enhancements to our GPS constellation, including higher-power military signals, new civilian signals, upgraded nuclear detection system payloads, and hosted search-and-rescue payloads. GPS Block III features improved signal strength and accuracy, increased anti-jam power, and a longer expected design life. The next block of GPS, GPS Block IIIF—available for launch in FY26—will deliver regional military-code protection, a higher power signal in a given geographic area of operation to boost anti-jam capabilities for contested environments.

GPS Operational Control Segment Next (OCX)

Operational Control Segment Next (OCX) will develop and field a modernized ground system required for the command and control of GPS satellites. The OCX program is on track to meet current Acquisition Program Baseline cost and schedule milestones. OCX provides expandable, robust information assurance architecture to significantly improve cyber resiliency, enabling the latest military and civilian GPS signals, improving cyber protection, and allowing the system to evolve to combat emerging threats. We have completed product test, are currently progressing through segment integration, and will transition to operations in FY22.

Military Global Positioning System User Equipment (MGUE)

Military GPS User Equipment (MGUE) will modernize user equipment to enable precision fires, safe navigation, and time coordination across multiple platforms in GPS-degraded environments. Military-code receiver cards embedded in weapon systems enable cyber-secure, anti-jam, and anti-spoof precision, navigation, and timing for the joint force and our partners. MGUE Increment one (1) completed developmental testing of the Army and Marine Corps lead platforms in FY20. MGUE efforts support finalization of card design, testing, and integration with Navy and Air Force lead platforms. MGUE Increment two (2) leverages the MGUE Increment one (1) technology to the maximum extent while addressing the production of M-Code integrated circuits far into the future.

COMMAND AND CONTROL (C2)

Our top priority is to develop a Joint All-Domain Command and Control System to ensure United States Space Command and their joint and coalition warfighting partners have the capability they require to command and control in a contested domain. We have made considerable gains this year, fully integrated in, and helping lead, the Advanced Battle Management System (ABMS) effort. In recognition that legacy space command and control capabilities are insufficient for us to prevail in future conflict, we have prioritized the delivery of space command and control capabilities using a development, security, and operations (DevSecOps) approach to acquisitions. Leveraging the agile approaches of commercial software developers, we are rapidly developing cyber-resilient capabilities that enhance U.S., allied, and partner nation operational-level space warfighting capabilities against the adversary.

The initiatives below build and sustain the infrastructure required to connect sensors to shooters using machine-to-machine planning and tasking of warfighting capabilities.

Unified Data Library (UDL)

The Space Force built and delivered the Unified Data Library (UDL), a cloud-based, cyber-accredited, multi-classification data store that facilitates universal data access and serves as the foundational element of the ABMS data architecture in partnership with the Air Force. UDL provides all-domain secure Space Domain Awareness (SDA) data sharing from all Services and sensors to support space-focused Battle Management and Command and Control; it is also extensible to fit the needs of Joint All-Domain Command and Control. This effort adds long-term access to a wide variety of space domain awareness data sources including commercial, allies, and academia. The UDL creates unified, agile procurement of commercial products to bolster Combined Space Operations Center and National Space Defense Center operations. Additionally, it protects satellite tracking data by seamlessly integrating defensive cyber operations.

Space C2 Open Architecture Operational Prototype (SCOOP)

The Space Force has also delivered the Space C2 Open Architecture Operational Prototype (SCOOP) program, a modern cloud architecture that is connected to 40 sites nationwide. Leveraging the Department of the Air Force's prior work on open architecture standards, SCOOP delivers a command and control capability for our most pressing needs, with the ability to connect into other domains, and serves as the foundation of our next generation C2 capability.

Space Domain Awareness (SDA)

Space Domain Awareness (SDA) is the cornerstone of our ability to command and control warfighting capabilities. The Space Force budget invests in new terrestrial radars, optical sensors, and space-based capabilities and commercial partnerships to increase the quantity and quality of space observations. A robust SDA architecture improves our indications and warnings, ensures freedom of action in space, and enables joint and coalition options to defend critical space capabilities. Additionally, investments in secure connectivity and data sharing tools improve our collective understanding of our adversaries' capabilities and intent.

Nuclear Command, Control, and Communications

As part of Department of Defense's efforts to modernize the nuclear triad, the Space Force will provide and modernize the space and mission control segments for worldwide, secure, jam-resistant, and survivable communications. We are pursuing digital development efforts for the future disaggregated strategic and tactical satellite communications systems to meet emerging threats in the 2030-timeframe. Evolved Strategic SATCOM will continue the strategic mission of the Advanced Extremely High Frequency (AEHF) satellite program with improved on-board resilience features, upgraded satellite capabilities, and cybersecurity features. We are leveraging rapid prototyping demonstrations to speed the delivery of the space segment to meet the warfighter need date in 2032.

Space System Prototype Transition (SSPT)

Space System Prototype Transition (SSPT) is a portfolio of programs that rapidly advance next-generation space capabilities to the warfighter at the speed of relevance. The portfolio leverages the commercial industrial base and demonstrates common defense through partnerships to enhance resiliency. One example is the development and integration of space domain awareness payloads on two Japanese Quasi-Zenith Satellite System spacecraft. The hosted payloads will increase sensor diversity and enable space surveillance and event detection over USINDOPACOM in the geosynchronous orbit regime.

Transition to Enterprise Ground System (EGS)

Enterprise Ground System (EGS) will enable the transition from a family of legacy stovepiped satellite C2 systems to an improved, open, resilient, and common platform. The effort funds modernized system interfaces, virtualization, and the translation of mission applications to ensure rapid response to emerging threats and integration of new capabilities. We continue to develop a Minimum Viable Product for foundational services and infrastructure to provide an initial Enterprise Capability. EGS will integrate multiple new mission partners within the Space Warfighting Construct & Missile Warning mission threads, scale multiple services for existing mission partners, and integrate them at one or more of three EGS locations. Continued investment provides foundational services and infrastructure to deliver enterprise-wide command and control services to all Space Force satellite programs. We are on track to deliver a fully integrated system by 2028.

ASSURED ACCESS TO SPACE

National Security Space Launch (NSSL) provides assured access to space for the nation's most critical warfighting and intelligence capabilities. To meet the full set of National Security Space requirements, we must continue to competitively invest in domestic launch providers' development of new launch systems. The Space Force, National Reconnaissance Office (NRO), and the National Aeronautics and Space Administration have a coordinated strategy to certify new entrants to launch payloads, and continue to work with different launch providers to reliably meet our national requirements. The Space Force recently completed a five-year strategy to bolster a commercially competitive market and transition to domestic launch systems by awarding the NSSL Phase Two procurement contract.

Leveraging this strategy, we are pursuing five National Security Space Launches to deliver warfighting capabilities on time. Following the outcomes of our Phase Two launch procurement strategy, we will continue to engage with industry partners regarding emerging launch requirements and technologies to invest in continued assured access to space.

National Security Space Launch (NSSL) Enabling Investments

We are investing in multiple public-private partnerships to develop enabling technologies for future space access, mobility, and logistics. Targeted investments in orbital transfer, on-orbit servicing, digital engineering, and novel on-orbit propulsion technologies will increase U.S. access and freedom to operate in space. We will continue to invest in providers of domestic launch services enabling our transition from non-allied space launch engines to domestic rocket propulsion systems. We will also continue technical maturation, risk reduction, and public-private partnership investment to expand domestic and cost-effective solutions for assured access to space. Additionally, the Space Force's research and development standards must reflect both the mission areas and the threat environment. The Space Force is building a more defensible and resilient space defense architecture by disaggregating on-orbit capabilities. We are building agile and threat responsive systems to complicate targeting.

Additionally, we are building redundancy and resiliency countermeasures into the spacecraft and payload designs of our systems.

WAY FORWARD

Congress established the Space Force to ensure freedom of action for the United States in, from, and to space. This Department of the Air Force Posture Statement builds on FY21 efforts in strengthening our ability to deliver flexible capabilities and strategic options at operationally relevant speeds to outpace emerging and dynamic threats. The Service's streamlined and integrated organizational design also creates new military options with the joint force, inter-agencies, industry, and our partners and allies. We are eager to work with Congress to build a common understanding of both the strategy and the investments needed to secure our Nation's vital interests.

Senator TESTER. Thank you, General Raymond.

We will start with questions. Senator Leahy.

Senator LEAHY. Thank you, Mr. Chairman.

And I might note as a personal matter, I enjoyed talking with General Jones before we started about his time at Aviano Air Base, which is about 2 or 3 miles from where both my maternal grandparents were born, and Senator Shelby has been there, been there with me.

Secretary Roth, I have followed the Air Force's investment in electrical vertical takeoff and landing vehicles, or eVTOLs, I believe you call them. I even provided a recorded message for the AFWERX's virtual Agility Prime event last year.

When I am home in Vermont, actually I land at the Burlington airport. And I can walk from where I got off the plane to Beta Technologies, and I see one of these eVTOLs built by that company running test flights in our skies, and it is pretty impressive.

The budget request includes \$57 million for Agility Prime, makes it the centerpiece of a new AFWERX initiative called AFWERX Prime, as you know. And what have you learned from Agility

Prime that sets a model for this new approach to use Federal dollars to complement private investment?

Secretary ROTH. Well, exactly as you outlined, Senator Leahy. I think the key for Agility Prime, and in particular the entire AFWERX initiative and efforts and all, is for us to leverage in a much greater way commercial capability. In fact, one of the names for the head of AFWERX is our “chief commercialization officer.” And so that is the key here is this is our way of seeking out partnerships with nontraditional defense or nondefense contractors and innovative kinds of organizations as well.

Over the last couple of years, we have awarded over 1,500 contracts through the AFWERX initiative for about \$700 million, and 75 percent of those 1,500 contracts were new—new to the Defense Department. That is exactly the kind of thing that we want to leverage going forward.

Senator LEAHY. And I know we put—the last couple of years, we put \$25 million—

Secretary ROTH. Yes.

Senator LEAHY [continuing]. From this committee for Agility Prime, and so you feel that what was accomplished from that leads to the doubling of the request for this year?

Secretary ROTH. Yes. It is part of our science and technology program. And Agility Prime, you know, it is a neat effort, as you say. People nickname it “the passenger car” and all, and it may have some combat rescue kinds of efforts or logistics support and all. But it is just an opportunity to do things that we don’t normally do, and it has worked to such an extent we are now going to stand up a SpaceWERX as well, okay, to try to do the same sort of things with the space capabilities.

And again, it is our way of trying to plug in—we understand the commercial market, and many of these technologies is way ahead of us.

Senator LEAHY. So I am not wasting my time going by and seeing what they are doing?

Secretary ROTH. No, I hope not. I actually hope not. We are very excited by what is going on there, and it is all a matter of, you know, we have taken a lot of beatings over the years of stovepipe, overly bureaucratized sort of acquisition process. This is a way of breaking that paradigm and looking at innovative ways of doing things, smarter, quicker, and tapping into new technologies.

Senator LEAHY. Thank you.

And General Brown, the Vermont National Guard’s newest aircraft, the F-35A, has been operating at full capacity in Vermont for a year, over a year now. They have met all their training requirements. They participated in responding to the pandemic under our governor’s command.

My only concern I had about them is that the smart system purchased by the Air Force to manage that fleet’s sustainment remains behind in its capabilities, and I worry about the maintenance and sustainability of the F-35. I know you want to take care of our people every way you can. So my final question is, are you looking at if this is being done as well as it could, the maintenance and all? Whoever wants to answer.

General BROWN. Sure. I appreciate the question.

And one of the key areas for us, as we work the sustainment and to bring the sustainment costs down for the F-35, is not only what we do in terms of the Air Force, but it is a close cooperation with the joint program office, with our industry partners, as we have worked through bringing down sustainment costs.

And the key piece for the Air Force, one of the areas is how we work our flying hour program, which that drives the fuel cost. It is also how we work our manpower and how we work parts. And we are focused on how we work through all three of those. And one of the areas that is unique or different from what we have normally done is to do more of our work in the synthetic environment or in simulators, particularly with a very high-end capability in some of the sense of things we want to do that can also help to drive down some of the sustainment costs.

Senator LEAHY. And I apologize for saying at one point "General Jones," and of course, I meant General Brown.

And General Raymond, our talks that we have had before I really appreciated, and I hope we can have some more of those this year.

So thank you all very much, and thank you, Mr. Chairman.

Senator TESTER. Yes. Senator Shelby.

Senator SHELBY. Thank you. Thank you, Mr. Chairman.

The Department of the Air Force posture statement notes, and I quote, that "competitors like China and Russia are challenging America's advantage in space by aggressively developing weapons to deny or destroy U.S. space capabilities."

General Raymond, could you discuss here in open hearing what you can what the Space Force is doing to ensure that U.S. military and commercial space assets are protected from these threats, as much as you can?

General RAYMOND. Absolutely. Thanks for the question.

And that threat, as I mentioned in my opening statement, is very robust today, and it is growing, and it is very concerning.

Senator SHELBY. That threat is real, though, isn't it?

General RAYMOND. It is real today. It is not something that we are thinking about that is going to materialize. It is real today and something that we have to address.

We are addressing it in multiple ways. One, we are developing and training our folks to operate in a contested domain. We are developing tactics, techniques, and procedures to be able to operate through that congestion. We are designing new architectures. So rather than having a satellite constellation that has a handful of very exquisite, very expensive, very slow satellites that are not very defensible, and shifting to a more defensible architecture.

We are also developing international partnerships to the level that we have never had before in the national security space side, and what used to be one-way partnerships now are really two-way partnerships that are delivering advantages. We operate together. We train together. We exercise together. We wargame together.

And for the first time, we are actually developing capabilities together, and now we are getting capabilities onto orbit faster at a reduced cost. And so there is not just one thing that we are doing. There is everything that we are doing as we establish this Space Force is focused on being able to stay ahead of that threat.

Senator SHELBY. We recently—this subcommittee under the Chairman's leadership, we recently had a classified hearing regarding a lot of the future issues that we could talk about there. But the Air Force fiscal 2022 budget request includes increased development funding for the nuclear enterprise, hypersonic weapons, advanced fighters, and so forth.

What could you discuss here in open session whether there is such a need to focus on other technology areas?

General RAYMOND. Inside the space domain, there absolutely is, sir. And there are four things that we are doing.

First of all, we have to protect those capabilities that we have on orbit today. And so if you look at the budget request that we submitted, about 50 percent of that budget growth is for missions transferring over from other services. The other growth is on largely classified areas that we can go to in greater detail.

But it is protecting what we have. It is developing a new architecture to shift to a more defendable capability. Three, it is developing an offense because we are an armed service. And four, it is looking at what other missions should transfer to space because we can do it there more cheaply or more effectively.

And so it is balancing those four priorities, and I will be happy to go into significant detail in a closed hearing on capabilities.

Senator SHELBY. In a closed hearing. Isn't this a race, technological race that we cannot afford to lose?

General RAYMOND. Sir, I could not agree more. As I mentioned in my opening comments, we spend—and every taxpayer dollar is precious. We spend 2.5 percent of our budget on space. Space is a huge force multiplier.

All the other services—the Army, the Navy, the Air Force, Marines—and all of our joint war plans, all assume that we are going to have access to space and that we have freedom to maneuver. If you lose that, we have a strong risk of losing, and we cannot afford to lose space.

Senator SHELBY. General, could you—General Brown, I will direct this to you, sir. Can you comment on China's efforts, just what you can in open session, to increase capabilities, including their investments in advanced aircraft and hypersonic weapons? You know, that is a given. We understand that, and they are pretty far advanced. They have the technological base, do they not?

General BROWN. Thank you, Senator.

One of the things I would highlight is not only in my time here as the Chief of Staff, but the past year as the PACAF (Pacific Air Forces) commander was to watch how the People's Republic of China and their armed forces were increasing their capability in their testing of hypersonic weapons, their increased operational aspect of their aircraft, the increased range of their missiles. And we have got to continue—

Senator SHELBY. That is offense and defense, isn't it? Both.

General BROWN. Both offense and defense, yes, Senator. And so it is concerning to me that we have an advantage today, but I think we have still got to continue to move forward so we do not lose that advantage as an Air Force.

Senator SHELBY. Mr. Secretary, I leave one for you. The quest and the challenges that we all face in quantum computing, but that is something that could change just about everything, is it not?

Secretary ROTH. Well, it certainly can. And with that, things like artificial intelligence. So, I mean, there is a series of technological priorities that we have. One is microelectronics. We need to invest in microelectronics.

Hypersonics, the general mentioned hypersonics. We need to invest in hypersonics.

And artificial——

Senator SHELBY. Are they interrelated somewhere at times?

Secretary ROTH. They are all interconnected in some manner, shape, or form. Absolutely, Senator. You are spot on.

Senator SHELBY. But it is the next generation, isn't it?

Secretary ROTH. Well, that is the point. We are looking to the future. We are looking to 2025, 2030, and beyond. And our sense is we need, given the major power competition that we are facing here in the future, that we need to target our investments toward the future.

Senator SHELBY. In the area of cybersecurity, we have recently witnessed in this country a little of it, but a lot of it in the East Coast that shut down the pipeline, Colonial pipeline temporarily. We have the capability to do a lot of things, too. But a lot of these countries don't really own up to what they are doing or they let other people do under their umbrella, so to speak.

How do we get our hands on defending cybersecurity there, and is it more of a challenge than people think?

Secretary ROTH. I will start, and the two generals can come bail me out at some point here.

Senator SHELBY. Okay. It goes through Defense and everything, but also the private sector.

Secretary ROTH. Yes. No, we need to partner with the private sector. We—of course, we help work with CYBERCOM in terms of their capabilities. Some of our airmen and guardians are on their team, on their cybersecurity teams and these kinds of things. So we work very closely with them.

We are also very concerned about protecting our networks, and I will say, for example, that a lot of what we are going to do in the future is this Joint All-Domain Command and Control. Our piece of this is the Advanced Battle Management System. Data security, cybersecurity, in order to get that data from point A to point B, becomes absolutely fundamental for us to operate in the future.

Senator SHELBY. Thank you. Thank you, Mr. Chairman.

Senator TESTER. Yes, thanks, Senator Shelby.

I am going to get a little more parochial. So this is for you, General Brown. I would like to get an update from you on the MH-139 helicopter. This helicopter is vital to our ICBM (intercontinental ballistic missile) bases, but there are no funds in this budget to buy more in 2022.

So a couple questions. Number one, if there are any problems with the MH-139, what are they? When will they be fixed? And in Montana, for example, these helicopters were supposed to be here in the fall of 2021. They are projected to be there in the fall of

2023, but this budget looks to me like they are not even going to be there in the fall of 2023.

Could you just let me know what is going on?

General BROWN. Sure, Senator. One of the challenges we have run into, this is the MH-139 is built on a commercial platform where they added military equipment to it. And then in the process of testing, we ran into a couple of issues on the military application that was added to the commercial helicopter.

We are resolving that piece. At the same time, we are continuing testing with the rest of the MH-139, and the intent here really to get to about the second quarter of fiscal year 2023 is when we expect to have the delivery of the MH-139, which is part of the reason why we did not go and procure during this particular budget cycle as we complete the testing.

Senator TESTER. So give me that again. Can Malmstrom expect those helicopters in the fall of 2023?

General BROWN. Second quarter 2023 is when we expect to—fiscal year 2023, so it would be the fall or even a little bit before that.

Senator TESTER. Okay. And what impact not having any money for those helicopters in this budget mean?

General BROWN. It doesn't—we are continuing the testing. It is just we are not going to procure any during this particular budget cycle.

Senator TESTER. Okay, okay. But these are already procured, right?

Secretary ROTH. Senator that delay actually is just a matter of months. The contract award in fiscal year 2022 was scheduled for the fourth quarter.

Senator TESTER. Okay.

Secretary ROTH. And because of the slippage in the FAA (Federal Aviation Administration) certification, it is now slipping into fiscal year 2022—or 2023, excuse me. So the 2022 money was actually unexecutable. So we simply made a bit of a budget shift, and the delay there is months, not years.

Senator TESTER. Gotcha. Thank you.

So, General Brown, I want to talk about 130s for a second. I talked in my opening statement about the fact that legacy, if you walk up to me and say we don't need this equipment anymore, I value that perspective. And quite frankly, I am going to do my best to make sure that we meet the needs of the Air Force, and if these aren't needed anymore, we should do away with them.

I do have a question about the C-130s, though. And that is there are many, many Guard units throughout the United States that have them. They seem to be a pretty good aircraft. They have certainly stood the test of time, and they still have a pretty, I think, important cargo aspect to them from an airlift capacity.

This budget divests of eight of those C-130Hs. So the question is, number one—and I hate to ask this question, but I have got to ask this question. When you are looking at needs, are you looking at domestic needs, too? I would assume the answer to that is yes?

General BROWN. We are. We look at both the needs for our national security both overseas, but also here inside of the United States for home and defense, both of our—

Senator TESTER. Okay. So what information do you have that shows that the National Guard has excess tactical airlift capacity?

General BROWN. It is part of the analysis we do with TRANSCOM (United States Transportation Command) as we look at this overall C-130 fleet. And as we look in that end, C-130Js, the C-130Js are a bit more capable as far as range and as well as capacity—

Senator TESTER. Yes.

General BROWN [continuing]. Than our C-130H models. And we are upgrading from our H1 to our H2 and H3, which provides some additional capacity from the older C-130s.

Senator TESTER. So can you tell me—I hope you can, actually—how many National Guard squadrons are going to lose flying missions in this budget?

General BROWN. In this budget, that is kind of a complicated question. As we look at not only C-130s, but with all the things that we are trying to get done across the Air Force, in some cases, it is a one-for-one, where we are going from H models to J models for the C-130.

Senator TESTER. Yes.

General BROWN. The same thing on our tankers, KC-46s to replace 135s and KC-10s. In some cases, we are going to look to move to future missions. And I will have to come back with more details on the specifics, if you have a specific location you are interested in.

Senator TESTER. So the last one, and then I am going to move on to Senator Moran. But is it fair to say that there will be some Guard unit squadrons gone after this budget is implemented?

General BROWN. I wouldn't—Senator, I wouldn't say gone. What I would say is what we are doing with each one of our Guard units is not to leave any one of them uncovered.

Senator TESTER. Okay.

General BROWN. And making sure that we have missions, whether it is going back into a C-130 or into another airplane, but missions that are required for the United States Air Force, not only for the Air Force, but for our joint teammates and for our Nation.

Senator TESTER. Okay. Senator Moran.

Senator MORAN. Chairman, thank you.

General BROWN, let me continue with you. I am pleased to see that the Skyborg program is moving forward. Unmanned autonomous wingmen have, I think, a real potential to protect our pilots while acting as a force multiplier, and I appreciate especially that the Air Force has recognized the expertise of a university in my State, Wichita State University, and decided that they should be a part of the Skyborg program.

Would you discuss for me the importance of digital design and advanced manufacturing as the Air Force—as new Air Force programs such as Skyborg are announced and undergo a less traditional acquisition process?

General BROWN. Sure. Senator, I see it as kind of the way of doing things in the future when you look at a digital acquisition approach or use digital engineering, open mission systems, and agile software to develop our capability much faster than we have in the past. At the same time, being able to do that not just inside

of the Department of Defense, but how we also work with our industry partners, both our large industry partners or even smaller companies that we don't normally engage with or have not traditionally engaged with. But also as we work with academia, like Wichita State.

Those opportunities are tremendous because of the brain power and innovation we have within our Nation to bring that capability together to use it not only for our national defense needs, but for other needs in terms of the Nation.

Senator MORAN. I appreciate that answer. Would you describe how digital design transforms the way the Air Force designs and maintains its aircraft?

General BROWN. One of the pieces about digital design is now you can actually share the design of whatever platform or whatever aircraft not just with the company that is building it, but with all the subcontractors. And so, when they are able to share that design, all the pieces and parts come together much more quickly.

And having had a chance to visit some of our industry partners that are going down this path, it speeds up the process to be able to manufacture capability. It drives down the risk in execution in building and gets us on cost and on schedule much better than we have been in the past.

Senator MORAN. The overall budget and the end of the year strength reductions are troublesome to me, Air Force and otherwise. My understanding—and as an example of the concern, my understanding is that the Air Force is still working to restore manning levels, person levels for fully qualified aircraft maintainers since sequestration.

And so those two things seem to me to be in conflict, and this may be for the Secretary. What is the Air Force planning to do to protect its aircraft maintainers from overwork and ensure that our most skilled maintainers want to stay in the Air Force?

General BROWN. I will start. So as we have plussed up our manpower since sequestration on the maintenance side, so we are fully manned on our maintenance. But we are also building their experience, and so that is important from that aspect.

The other is how do we work smarter, not harder? And being able to use the advantages of technology, we just talked about digital engineering. That approach helps us to speed up our ability to fix and maintain our aircraft, but we are also looking at our retention models and how we support the retention of that quality airman and quality talent that comes into our Air Force, and so we are not having to continue to retrain.

And so we are making progress in these areas. I am pretty proud of the fact that we are fully manned. But again, we have got to experience that full manning to ensure we can actually be ready—

Senator MORAN. General, let me understand your answer. Are you suggesting—and this is not I am taking offense at it. But the premise of my question is, is no longer accurate, that things are okay in this manning situation?

General BROWN. Well, as far as we are close to 100 percent manning. It is just the experience levels. We brought a number of young airmen in at the same time, so building up their experience.

So we have the numbers, but the experience level needs to increase.

Senator MORAN. Okay. Thank you.

Thank you.

Senator TESTER. Senator Feinstein.

Senator FEINSTEIN. Thank you very much, Mr. Chairman.

General Brown, it was good to speak with you on the telephone 2 weeks ago, and I would like to follow up with you and the Secretary on an issue I raised during our call. California, as you know, is facing a horrible drought, and we have had 5 times as much acreage burn this year so far as we had last year. Last year, 4 million acres, 10,000 structures, including 5,000 homes, burned. So that tells you a little bit about the size.

Yesterday, I received your letter—thank you very much—updating me on progress in modifying the seven Coast Guard aircraft for transfer to the State of California and to CAL FIRE in particular for firefighting. This was directed in the 2019 Defense Authorization Act.

So here is the question. You state in your letter that the last aircraft will be delivered in June of 2023. You also say that you will accelerate the timeline if you are able to. So is there any news for California? Is there anything that we can do to help you accelerate delivery?

General BROWN. Again, I appreciate speaking with you as well.

And a little more detail from our conversation and the letter, the summer of 2023, June of 2023 will be the last of the seven aircraft. The last of the seven aircraft will be delivered in June of 2023. There are already—the steps for the aircraft is to go through a depot maintenance and then put the retardant delivery system onto the aircraft.

So there are two aircraft that are already through the depot and going through the process of getting the retardant delivery system put on in Sacramento. And so the first two will be done at the fall of 2022. And then it will be through the next 6 to 7 months you will get the rest of the aircraft by June of 2023.

And my commitment is to try as much as we can to work with California and the depot there in Sacramento to accelerate as much as we can.

Senator FEINSTEIN. Well, it is very much appreciated. As you know, these are big fires, and the amount of acreage burned is really huge.

I hope to get in a second question. The budget put forward by the Department of Defense and by the Air Force is driven largely by the need to compete with China. Today, the Senate is considering a very broad array of measures to get tough on China. At the same time, I have a very strong belief that dialogue is critical to ensuring transparency and to reducing misunderstandings.

One of the things that I learned is that there has never been a military-to-military communication on an ongoing effective basis with China. And I have written about this, and is there any effort to change this and improve relations with some military-to-military contacts, as many nations do? I think it would be a big help.

General BROWN. Senator, I would have to defer to our—within the Department of Defense policy on where they are as far as work-

ing through this process. But I will tell you that I would support the opportunity for myself and I think for the other service chiefs to communicate at a senior level to avoid miscalculation that may cause greater risk for all of us. And I agree with you. Dialogue is important.

Senator LEAHY. I would agree.

Senator FEINSTEIN. Thank you. Thank you, Mr. Chairman.

Senator TESTER. Senator Murkowski.

Senator MURKOWSKI. Thank you, Mr. Chairman.

Gentlemen, thank you all for being here. Thank you for your leadership.

General Brown, let me begin with you. You and I have had an opportunity previously to discuss the need for additional tanker support for missions and training in Alaska. Earlier this year, we were made aware of an additional four KC-135s that are going to join that fleet at Eielson. Thank you. Thank you for that. We appreciate it.

I am also aware of the Air Force plan to divest the KC-135s as the KC-46s are available to replace our aging tanker fleet. Can you give me an update on the current timeline for divestiture, when we might begin seeing those in Alaska, and then, as a follow-on, whether or not those KC-135s will be replaced with the KC-46s and whether there is a chance that those KC-46s will rotate in and out of Alaska in the interim?

General BROWN. Sure. So as far as the four KC-135s that we spoke about that are coming to Alaska with about approximately 200 airmen and their families, that should occur in fiscal year 2023.

Senator MURKOWSKI. Okay.

General BROWN. That will be after we have gone through the environmental assessment to bring up that capability.

What I do see, based on mission requirements and the opportunity to train up in the JPARC (Joint Pacific Alaska Range Complex) with RED FLAG-Alaska, is the opportunity for KC-46s to come in either to support actual missions and/or to do training. And so I do suspect that you will see KC-46s operating up in Alaska. I would also add as we—as the Air Force has laid out its Arctic strategy, to operate the KC-46 in an Arctic environment will also be important.

As we go to the future for our tanker fleet, to maintain our fleet of 479 tankers, we will get to 179 KC-46s and 300 KC-135s. So we will maintain KC-135s for a period of time. At some point, probably a number of years into the future, we will have to take a look at those remaining KC-135s and how we recapitalize those going forward.

Senator MURKOWSKI. But you do see those KC-46s as being part of this rotation in Alaska then at some point?

General BROWN. Yes, ma'am. Because just like most of our—for the Air Force, our capability to operate all around the world, as I say, anytime, anywhere, to include Alaska, is an opportunity to bring the KC-46s to Alaska and many other places around the world.

Senator MURKOWSKI. Good. Appreciate that.

We had a hearing a couple weeks ago with General Hokanson. This was the National Guard and Reserve hearing. And I had asked him if he could take a look into the HH-60 upgrades and the additional aircraft that are needed for the three rescue squadrons there at JBER.

What I am told is that these HH-60s that belong to the 176th have the highest operational tempo in the Air Force, and they have the highest utilization rate. We recognize that the wing needs additional and upgraded HH-60s. They got a pretty stepped-up mission demand, and then this growing focus, as you have just mentioned, that the DOD (Department of Defense) has placed on the Arctic region just really just builds on that.

The current plan to bed down additional aircraft in the State isn't targeted until 2026. So there is kind of a misalignment here, and I raised this with General Hokanson. He mentioned at that hearing that he intended to connect with you to talk about this. So I would ask you the same question.

What options exist to allow for perhaps a reprioritization of these assets, and is this utilization rate calculated in the decisionmaking process?

General BROWN. Senator, as we looked at the laydown for our HH-60s and our "gulfs" and our "whiskeys," which are our new models, we do the swap-out based on the oldest aircraft. And the Alaska Air National Guard, with their HH-60s have the newest of our G models that they just received in 2020, which—and we do look at the operational tempo. We also look at the age of the aircraft as we make that transition, which drives to where Alaska now has the newest of the Gs.

And then they will be in line to get the newest—the "whiskey," which is our newer model, as you describe in 2026.

Senator MURKOWSKI. Again, we recognize that there is a lot of work that goes into that particular mission.

My time has expired. But General Raymond, know that I would like to follow up with you, and I will probably do so by way of a question for the record, with regards to updates on where we are with the Space Guard Reserve force. As you know, we have had an opportunity to talk about the role of Clear Air Force Station there and how that is just key to essential Space Force assets.

So I will look forward to that update.

General RAYMOND. Thank you, ma'am. I look forward to it.

Senator MURKOWSKI. Thank you. Thank you, Mr. Chairman.

Senator TESTER. Senator Schatz.

Senator SCHATZ. Thank you, Mr. Chairman. Thank you, Generals and Mr. Secretary.

I want to talk to you, Mr. Secretary, about energy reliability. The President issued an executive order establishing a Federal clean energy standard—electricity standard, excuse me, and it requires all Government agencies, including DOD, to use their procurement authority to help move the country toward a carbon-free electricity sector by 2035.

So can you talk to me about how you are using your procurement authority to comply with the President's executive order?

Secretary ROTH. We are, in fact, using that authority. We have focused on developing a series of energy projects that try to en-

hance our installation resilience. And so we are using some pretty well-established contract avenues and venues to both utilities and energy savings companies in order just to improve our posture in terms of the energy resilience of our bases.

There is actually something called the Federal Utility Partnership Working Group that we are part of and that we work with in order to enhance our energy resilience.

Senator SCHATZ. Those sound like ongoing efforts. Is there anything that you have changed as a result of the President's executive order?

Secretary ROTH. Well, these are actually—the answer is we have budgeted in fiscal year 2022 an additional \$68 million over and above what we have had in terms of the past—the past level of funding in order to increase our emphasis on those kinds of things.

And there is two kinds of energy resilience that we looked at in particular. One is installation resilience, and of course, we are a major energy user for our aircraft as well. In terms of the entire Defense enterprise, we, the Air Force, for better or worse, use two-thirds of the total fuel bill in the entire Air Force.

Senator SCHATZ. I want to just drill down a little deeper because—

Secretary ROTH. Sure.

Senator SCHATZ [continuing]. It seems to me that there are projects and programs and initiatives, right, energy savings performance contracts and all that. And then the fuel stuff is, I think, a longer lead time item, we can all agree.

But specifically using the procurement system for your sort of run of the mill, especially based on installation operations is what I am trying to get at. Because I think you can carve out a sort of clean energy project and point to it. That is one thing. But unless you use the full power of the Department and its procurement authority, then I don't think you are entirely complying with the executive order.

And I would ask you to take another look at that and not just sort of rely upon, hey, what are we doing in clean energy, and how does that match up with the President's executive order? But rather, we have got these authorities. The President is asking us to use those in our daily procurement of energy, and I think that that part hasn't quite yet happened.

First of all, do you agree with that, or do you think I am getting that wrong?

Secretary ROTH. I am not sure. So let me do this. Let me commit to you, let us get together and let me send some of the folks who are the subject matter experts to talk to you. I am not that deep on it, and so I think that is a fair point. And I think let us provide you more details, and we can go from there.

Senator SCHATZ. Okay, thank you.

And just following along these lines, after Hurricane Michael destroyed part of Tyndall Air Force Base and damaged more than a dozen F-22s there, the Air Force made a very quick basing decision to move three F-35 squadrons to the base. And it is—there is just no evidence, and I have looked very hard for it, that the Air Force made that decision with any consideration of the fact that we are facing increasing severity and frequency of severe weather.

And especially where Tyndall is, it is almost a guarantee that it is going to get hit again with a severe weather event. And so I would like you to tell me whether there is something I am missing regarding the analysis that was performed in deciding to base the F-35s there. I get the range issue, although there is—as you know, there is an Air Force installation I think 90 miles away. So there is an argument around that.

But more specifically, even if you did arrive at this is an important range, we don't want to lose it, it is perfect for the F-35, you still have to do a climate analysis, right? Not for ideological reasons, but because we don't want to lose our assets again. And I am wondering if you can speak to whether or not there was any analysis about severe weather impacting our assets?

Secretary ROTH. What drove the decision in general was, in fact, the availability of the airspace and the fact that it is a terrific asset for us to train with. That said, I think we are actually pretty proud of rebuilding Tyndall. If you have an opportunity, we would love for you to come take a look at it.

It is going to be a model base, and we are taking the climate impact very much into consideration. The building that we are doing is well above building code. We are going to make sure that our buildings can absorb a certain amount of storm surge. They are going to be a foot or more above what they were before. And the buildings are going to be built to a higher wind standard, 165 miles an hour, whereas I think the local code is something like 125 miles an hour.

So we are well aware of the kind of risks that are involved in that region, and we are going to try to make sure that Tyndall is much more resilient than it was in the past.

Senator SCHATZ. Thank you.

Senator TESTER. Yes, we got great airspace in Montana, too.

Senator BOOZMAN.

Senator BOOZMAN. Thank you, Mr. Chairman, very much. And thank you for having this very important hearing.

Secretary Roth, we appreciated your phone call last week regarding the basing of the F-35s and the Air Force, the Singapore Air Force F-16s. That was good news. And again, as I said, that is great for the area and all of that, but that really is the best decision for the country.

General Brown, we appreciated getting to visit with you on the phone not too long ago and talking about Air Force priorities. Yesterday, I had the opportunity to visit with Chief Bass. She represents you very, very well and I think is doing an outstanding job. You all make a great team.

And General Raymond, earlier today, getting to visit with you about your priorities, I thank all of you all for the great job that you are doing, and we will help you any way we can. You know that.

The Air Force, General Brown, is looking at adding, growing its fleet of F-35s, fifth-generation fighters, in order to keep up to counter our adversarial threats. They are some of the most expensive programs in the defense budget. How does the Air Force getting—how are we doing that? And again, this is for all of you all. What are we doing to lower our procurement costs? How are we

able to sustain cost so that we can continue to equip our airmen with the best aircraft in the world? Either one——

Secretary ROTH. Well, I will start——

Senator BOOZMAN. Yes, sir.

Secretary ROTH [continuing]. And then we can move on. What we have adopted in terms of acquisition of new systems is we are trying to take advantage of many of the new authorities that have been provided to us in recent Authorization Acts in terms of trying to do things smarter, trying to do things quicker, and being more agile in how we do things, the greater use of prototyping, greater use of using sort of serial kind of procurement rather than focusing on one end objective and having a 20-year kind of an acquisition program.

So we are being much more agile. We talked earlier today about digital, the digital trinity. So we are using digital engineering. We are using open systems architecture. And we are using those kinds of capabilities as we go forward.

I would offer that two or three of our major examples of that that are in the fiscal year 2022 budget is one is the Next Generation Air Dominance program, which is platform-centric, and it is looking in terms of making sort of a serial improvement to the platform as we go forward.

The other is the global—the strategic missile, you know, the ICBM replacement program. And that, too, is using heavy-use. I actually had an opportunity to go out to Hill Air Force Base and visit with both the Government side and the contractor side, and it is just fascinating the way they are using just basically modeling, digital engineering modeling in order—and they have met every milestone in terms of cost, schedule, and performance to date. Still relatively early in the program, but they are making great progress.

So we are trying to make sure that we try to delegate down to the lowest level in terms of program management and to try to reduce the bureaucracy in terms of reviews. That said, we establish metrics. We establish risk-based metrics, and we are going to constantly look at whether people are meeting those metrics or not.

So, in general, we are trying to break the bureaucracy and trying to move more agile, quicker across the board.

Senator BOOZMAN. General Brown, quickly or the Chairman will yell at me, the F-15EX, why is it so important to the tactical fighter fleet, and what capabilities does it have that complement the fifth-generation fighters like the F-35?

General BROWN. The real capability of the F-15EX is the aspect that comes in to replace the F-15Cs. And the F-15Cs have really aged out. We need to retire those.

The beauty of the F-15EX is that really about 70 to 90 percent of the infrastructure equipment can actually—that we already have can be used. So it makes a very smooth transition to this particular capability. It will also complement because of the size in payload they can carry, can be a weapons truck is the way we kind of describe it, to provide firepower where we have the F-35 that actually now can penetrate more deeply, and the combination of those two provide things that our adversaries have to think about be-

cause we have several different options of ways we can come at them.

Senator BOOZMAN. Good. Thank you.

Note, Mr. Chairman that I got done on time.

Senator TESTER. Right on the mark. Senator Baldwin.

Senator BALDWIN. Thank you, Mr. Chairman.

General Raymond, given your desire for affordable access to space, you are well aware that we need to continue to lower the cost of space launch. And the Air Force Research Laboratory is doing some really good work in advancing the state-of-the-art rocket engines, particularly with regard to upper-stage engines. As a State that knows how to make things, Wisconsin has been proudly supporting these efforts.

In that context, as we review the Space Force's fiscal year 2022 budget, I note that rocket propulsion research and development is a particular area of concern. I want to ensure that it is adequately resourced to support domestic—stress “domestic”—high-tech manufacturing in support of future space endeavors.

So can I get your commitment to, number one, acquaint yourself with the Air Force Research Laboratory's great progress on the upper-stage engine development and, secondly, to ensure that future budgets include sufficient funding necessary to expand domestic capacity to manufacture the components that will support both our industrial base and affordable space launch?

General RAYMOND. You absolutely have my commitment. Access to space is critical to our national security. Being able to do it responsibly is also critical, especially in a contested domain.

Our launch has three—launch strategy has three components. One, to have assured access. Two, to increase competition. And three, to get off the RD-180 engine. And in all three of those tenets our strategy is working great, and we are in a really good spot.

We are now beginning to invest in kind of the Phase 3 areas that you mentioned, and I am open to all comers. We want more, broaden the industrial base, get more research and development money to be able to do that, and give us opportunities in the future. You absolutely have my commitment.

Senator BALDWIN. Thank you.

My next question is for the entire panel. President Biden announced that he will withdraw U.S. forces from Afghanistan by September of this year. Ultimately, while I think it was a very difficult decision, I think it was the right one to make.

That said, we all know that there will be an enduring counterterrorism and intelligence, surveillance, and reconnaissance requirements. Considering this decision was made while the fiscal year 2022 budget request was being developed, where in the Air Force and Space Force budgets are these enduring ISR and over-the-horizon requirements reflected? And do either need particular attention paid to them in this year's appropriations cycle?

Let us start with General Brown.

General BROWN. Senator, I appreciate the question. I will tell you that the capabilities that we have today that have been supporting United States Central Command when you talk about Afghanistan, but also all of our combatant commands, much of that capability still remains inside of the United States Air Force with

this particular budget. Although I will tell you we are also making a transition to the future.

So small levels of divestment as we start to look towards the future, maintaining the capability that we have been using today, at the same time looking forward at the capability that will ensure that we are able to be connected, be persistent, and be survivable not only in a mission environment, but in a highly contested environment as well.

General RAYMOND. I agree.

Secretary ROTH. Yes, and so in the budget, where would you see it in the fiscal year 2022? Amongst other places, although there is no longer an overseas contingency operation budget, so-called OCO budget, we have within the base budget, we are funding both day-to-day war operations at a much lower pace, about \$1 billion or so for the Air Force. But more importantly, to your point and your question, there is an enduring presence we still have in the CENTCOM (Central Command) AOR (Area of Responsibility).

And so we have budgeted about \$10 billion there. We have a series of air bases. They will stay for the time being. That is where your over-the-horizon capability will come from.

So we have funded as best we knew in a lead time away as it goes. We are continuing an enduring presence in the CENTCOM AOR in order to provide that over-the-horizon capability.

General RAYMOND. The great thing about space capabilities, ma'am, are they are global, and so you don't have to build something and just stick it over that part of the world. They are constantly orbiting. They provide that persistence and will continue to do so.

Senator TESTER. Senator Hoeven.

Senator HOEVEN. Thanks, Mr. Chairman. Appreciate it.

Thank you, gentlemen, for being here today. Appreciate it.

General Brown, thank you for your recent visits to both Minot Air Force Base and Grand Forks Air Force Base, very impressive. And also General Raymond, thank you for your recent visits to Grand Forks base and the surrounding area as well.

Mr. Secretary, I understand that our Chairman asked you about the MH-139 and that you gave good answers, at least from our perspective. Mine is simply are you confident we can keep that program on schedule?

Secretary ROTH. Yes, I think so. I think, as you are aware, the reason there is a delay in the program is that we don't have the FAA certification yet. But as I understand it, we are on schedule. This should only mean a fairly minor delay of some months in the program, and it is not a show stopper.

So our intent, we had eight aircraft that were funded already in fiscal year 2021. The next tranche will be funded in fiscal year 2023. The only reason you see a gap there in fiscal year 2022, that particular procurement contract was simply not executable in our judgment during the 12 months of fiscal year 2022. So it was simply a shift from late in fiscal year 2022 into early fiscal year 2023.

Senator HOEVEN. And then both LRSO (Long Range Stand Off Weapon) and GBSD (Ground Based Strategic Deterrent), do you feel they are on schedule and can stay on schedule?

Secretary ROTH. Yes. Both programs, both programs are meeting all their schedule and cost milestones to date. Admittedly, I would say—and channeling my former comptroller background—it is still pretty early in both programs. But they are doing terrific, and both programs are making heavy use of some of the new technologies in terms of digital engineering and those kinds of things.

So both programs, we hope for the LRSO to be able to award the next contract this month. It is now shifting, as we speak, into the engineering, manufacturing, development stage, so-called Milestone B in our nomenclature. So they just had their board review, and we anticipate being able to award that contract this month.

Senator HOEVEN. Good. Thank you.

General Brown, same question. As far as the B-52 and the re-engineering, on schedule, and do you anticipate that we could keep it on schedule?

General BROWN. I do. We are at a point where it looks like really about this December we will be able to down select on the re-engineering down to the company that will actually do the re-engineering for the B-52.

Senator HOEVEN. Okay, good. And then also, what about getting a weapons generation facility going for Minot Air Force Base, which is the only dual nuclear base in the country as, of course, you well know. And again, thank you for your visit.

General BROWN. Part of our discussion when we were there at Minot was because of its dual capability, it will be the last of the three because we will learn quite a bit from the other two locations that we are going to do before we get to Minot. And because of its uniqueness, I think it is really important that we get this right. Not only for the others, but for Minot as well.

Senator HOEVEN. Well, we would like to work with your office to get a time for starting it.

General BROWN. Understood. Understood, Senator.

Senator HOEVEN. Thank you, General.

General BROWN. Thank you.

Senator HOEVEN. General Raymond, again thanks for your visit. So we are working on laser communication with satellites rather than radio waves. So ground to satellite, satellite to satellite, satellite to ISR. Why is that important, and talk to me about your commitment to accomplish that.

General RAYMOND. Sir, Senator, the importance is resilience. As I mentioned in our posture statement, the domain has become much more contested, and our adversaries are developing capabilities to be able to deny or disrupt our access to communication satellites. This provides a layer of resilience that is absolutely critical. It is what we are focused on.

Senator HOEVEN. So we very much need those low-Earth orbit satellites. We need to keep moving on this to stay ahead of our adversaries like Russia and China, and we need to develop the laser communications again to stay ahead of our adversaries, and it is a high priority?

General RAYMOND. It is a high priority, and I would say, Senator, we really need to develop kind of a hybrid architecture, and the work that we are doing to do that force design is a mix. Today, the

design is small numbers of very expensive, exquisite satellites, and we have to diversify that architecture.

For resilience, the low-Earth orbit piece of that is going to be important, as well as other orbits. But is absolutely critical.

Senator HOEVEN. Exactly. We need both.

General RAYMOND. Yes, sir.

Senator HOEVEN. Thank you very much.

Thank you, Mr. Chairman.

Senator TESTER. Senator Murray.

Senator MURRAY. Thank you very much, Mr. Chairman.

Thank you, gentlemen. Really appreciate your being here.

Secretary Roth, General Brown, let me start with you. The 92nd and 141st Air Force air refueling wings at Fairchild Air Force Base are really vital to our global mobility and our global reach, and it is important to me that we make sure that these units are optimally equipped to meet their mission. I really support the Air Force's recent selection of Fairchild as a candidate location for the next KC-46 main operating base. They have consistently been a top-scoring installation because of their strategic location, their existing infrastructure, and their strong community support. And it is long past time to get them those tankers.

But I am concerned that the proposed divestments of KC-135s will hurt the air refueling mission based in Washington State. What new missions and assets are you going to bring to Fairchild to continue investing in Fairchild and the community for the long term?

Secretary ROTH. Well, in terms of, as you said, the KC-46 is a competitor. We are all the way up to main operating base number six as we are going through our strategic basing process. So Fairchild is a terrific candidate to receive that next tranche of reserve of aircraft. So that is at least a partial answer to your question that we would bring—you know, we could potentially bring KC-46.

I would defer to the general here in terms of what other things.

General BROWN. And Senator, for the Air Force, we would also look at other mission sets as we evolve and transform and transition to the future of opportunities at Fairchild. Not only the KC-46, but other opportunities.

Senator MURRAY. Okay. And if you can get me more details on that, I would really appreciate it.

General BROWN. Yes, ma'am.

Senator MURRAY. Thank you.

General Raymond, the space industry is really growing rapidly. As access to space increases and demand for space-based products and services is really growing, my home State of Washington is becoming a major hub now for launch, satellite engineering, education, and many other parts of the space community. And that growth and innovation is really important, both for our economy and for achieving the goals of the defense space strategy, but Government support is going to play an essential role in helping this industry through its nascent stages until it can reach its full potential.

So talk with me about how the Space Force will use its market power to really encourage diversity and growth in the space industry?

General RAYMOND. Well, first of all, I would agree wholeheartedly with you that there is incredible things going on in that part of the country. I have been up there personally several times to visit launch and satellite manufacturing. It is really important.

I think if you look at the challenges that we face, the challenges that we face are many, but we have even greater opportunities, and those opportunities are those innovative small companies. And what we are doing to get after this is working a force design that allows us to diversify our architecture, to allow smaller satellites that are more operation relevant to be—to play a greater role in our national security architecture.

And so we are doing that design work now. That is going to open up more opportunities for those types of capabilities to be a critical part of our path going forward, and I think there is great opportunity.

Senator MURRAY. Good. Well, I look forward to working with you on that. It is really exciting.

General RAYMOND. Thank you, ma'am.

Senator MURRAY. Secretary Roth, across the country and in my home State of Washington, families are facing a real shortage of affordable housing. The military is supposed to cover housing costs as part of the servicemembers' benefits, but more than three-fourths of them are having to supplement that out of pocket right now. And of course, military moves are made more stressful by long on-base housing waitlists. We are seeing them everywhere and really competitive rental and buyers markets off base.

I am hearing from military families at Fairchild, for example, about they are just really struggling with these challenges. How does the Air Force evaluate the need for additional on-base family housing under the Military Housing Privatization Initiative, and what can be done to help families near Fairchild with this right now?

Secretary ROTH. Well, one, the basic allowance for housing is reviewed annually, and we work with our Office of Secretary of Defense partners to do the analysis. It is locality based. It is not a general rate across the country, and so it is tailored to each individual location.

And so the intent is that the basic allowance for housing cover the cost in any particular area. If it is not, if there is an unusual spike or something, we try to catch up as best we can.

In terms of actively looking forward in the future in terms of any further military housing, like privatization initiative and that type of thing, right now it was enormously successful 15, 20 years ago. We did a lot of progress and all, but we did so in part because we got an exception to the Office of Management and Budget scoring rules in order to allow us to capitalize with private money and put up a fairly modest amount of Government money and leverage some private money.

Under the current rules, the Office of Management and Budget has fallen back now to the old rules, where they would require us to capitalize that up front and under a full funding concept pay for it up front. That gets to be very expensive. So for the time being, unfortunately, we are not pursuing that. We would have to work

with the administration and the Office of Management and Budget to see if any further waivers were possible or not. But——

Senator MURRAY. I would like to follow up with you——

Secretary ROTH. Sure.

Senator MURRAY [continuing]. After this on that because this is really a critical problem for our families, and I am worried about the stress it is putting on them. And it is just not tenable at this point.

And I know I am out of time, Mr. Chairman. I did just want to mention childcare to all of you. The waitlists are really long, and we are hearing from everyone that this is just really a stark reminder that we need to deal with this.

I don't have time for a question right now. I will follow up with all of you, but I have not lost interest on this. And Mr. Chairman, it is a huge problem for our military families.

Senator TESTER. Thank you, Senator Murray.

Senator Durbin.

Senator DURBIN. Thank you, Mr. Chairman.

General Raymond, I was a skeptic when it came to the creation of the Space Force. I listened to critics argue that it was a new bureaucracy that would be top heavy, a pile of brass and not much underneath, and that it wasn't needed. I never questioned the role of space in terms of our own defense and the critical achievements which we can point to over the last few years.

So you are the man in transition from the old way to the new way. How has it changed?

General RAYMOND. It has changed significantly, and I will tell you it is quantifiable. When you elevate from a major command of an Air Force to a service chief, your level of authority and responsibility goes way up. I have a stronger role and requirements. I am a member of the Joint Chiefs, so I can make sure that space is integrated into the joint warfighting construct.

We interact more effectively with our allies and partners at the service level. In fact, with Norway, we just inked a deal where it saved us \$900 million to put two hosted payloads on their satellites rather than our own satellites.

The development of our space professionals has gone through the roof. Promotion rates before were 20 percent below the Air Force average for colonels, and lieutenant colonels about that same number. Today, we are above that average. We have got more people knocking on our door wanting to come into the Space Force than we have positions for. We can be very selective of who we bring in.

Across the board, we have seen measurable, quantifiable increases that is great for our Nation.

Senator DURBIN. So, General Brown, when you hear that, does it give you any kind of pause or inspiration for the rest of the Air Force in terms of what has happened with Space Force?

General BROWN. It does. And one of the key areas that I see is because of the elevation of Space Force, it actually has brought in more I would say collaboration between the Air Force and the Space Force across our airmen and our guardians because of the dialogue that happens at a much lower level on how we talk about space capabilities. And so there are some real pluses there.

The other part is now that we have someone who is really focused on that domain. A year and a half ago, 2 years ago, my predecessor would have been responsible for both. Now you have someone who is focused on a new domain, and it allows the both of us to really work very closely together on how we use those future capabilities and align those capabilities between our two services.

Senator DURBIN. Secretary Roth, are there any changes in procurement or acquisition with the Space Force that you are considering or have implemented?

Secretary ROTH. Well, first of all, the Space Force is another one that is making maximum use of some of the new authorities we have in terms of using things like digital engineering and being more agile and the like. So I would have to say that the Space Force is out and leading on that as well.

What is going to happen eventually on 1 October 2022, or at least no later than 1 October 2022, is the Space Force will have their own service acquisition executive. Right now, we have one service acquisition executive for both the air and space side, but under the Authorization Act of a year or two ago, we have to stand up a separate office, an Assistant Secretary of the Air Force for Space Acquisition and Integration. But space acquisition here to the point.

So I would think here, too, very similarly you have someone then who will be focused on space acquisition and won't be "distracted" by other functions as well.

General RAYMOND. Could I add in, sir? I just want to say very clearly that we would not be anywhere near where we are today without the great support of General Brown and the Air Force.

Now when the law was passed that established the Space Force, it said to focus on space superiority and rely on the Air Force for the support pieces. They provide us spectacular support. As we have built this, they have really been a huge partner.

Senator DURBIN. Secretary Roth, different subject. Our modern military has really been grounded on civilian control and the separation of men and women in uniform from political influence. What are you doing to make sure that the next generation serving in the Air Force lives up to that model?

Secretary ROTH. Well, I think the short answer to it is by leadership and making sure that the Secretariat does, in fact, use its authority and its influence as we go forward. Clearly, I think that is—you know, we are in a period of transition now from one administration to the other, so it is a bit of an uncertain time until we fill all the positions.

And so the imperative will be to get a full team of political appointees in place and then to move forward under the guise of ensuring military—excuse me, civilian oversight over the military. I work very closely with both of the chiefs. I value their opinion and all. But at the end of the day, the Secretariat is, in fact, the leadership position within the Department of the Air Force.

Senator DURBIN. Thank you.

General Brown, in closing, I just want to commend you for statements that you have made on diversity and race relations in the military. I am sure that there are many stories that have gone untold that you could fill us with, fill in with some of your experi-

ences. But thank you for reaching the top of your profession. I am glad you are there, and thanks for the example and model you set.

Senator TESTER. Thank you, Senator Durbin.

We appreciate you folks being here today. We appreciate the testimony you have given today, and we appreciate the job that you do every day. So thank you. I thank the witnesses.

ADDITIONAL COMMITTEE QUESTIONS

Senators may submit additional written questions, and we ask you to respond to them within a reasonable amount of time.

[The following questions were not asked at the hearing, but were submitted to the Department for response subsequent to the hearing:]

QUESTIONS SUBMITTED TO ACTING SECRETARY JOHN P. ROTH

QUESTIONS SUBMITTED BY SENATOR RICHARD J. DURBIN

TACTICAL AIRLIFT AIRCRAFT REQUESTORS

Question. I have been concerned about Air Force reductions in Tactical Airlift Aircraft inventory. The fiscal year 2022 Budget Request divests 8 C-130H aircraft, without funding for any new C-130Js, which would bring the total tactical airlift fleet down to 279 aircraft. This is despite the fact that the fiscal year 2021 NDAA requires a minimum inventory of 287 aircraft, and the most recent mobility capabilities and requirements study recommended at least 300 such aircraft to meet National Defense Strategy requirements. These cuts may disproportionately impact the Air National Guard, which provides half of the Air Force's tactical and mobility airlift while also supporting a number of critical domestic priorities—COVID-19, civil unrest, and natural disaster response. The 182nd Airlift Wing in my home state for example, has a strong history of outstanding performance, including among the highest mission capability rates in the Air National Guard over the past 10 years.

What would such a reduction have on the Air Force's ability to conduct overseas operations?

Answer. The proposed reduction in aircraft would have no significant impact on the Air Force's ability to conduct overseas operations. We continue to carefully analyze our tactical airlift fleet size and posture to ensure the nation's needs are met, and that this fleet does not take on a level of risk that is out of line with the other fleets in our Air Force. With a total tactical airlift aircraft inventory of 255, we believe 163 C-130Js and 92 C-130Hs, supported by 222 C-17s, are capable of executing the required level of tactical lift.

Question. Have any decisions been made about where such cuts may take place?

Answer. These decisions are ongoing. Over the next few years the Air Force goal is to reduce the C-130 fleet to 255 aircraft, contingent on our ability to find mutually agreeable replacement missions for any C-130 unit we would remission.

Retaining additional aircraft that are not required to compete and win in the future fight diverts limited resources from higher priority National Defense Strategy focused recapitalization and modernization efforts across the Air Force enterprise, weakening our military's competitive advantage. Incremental reduction of the fleet will allow the Air Force to refocus personnel and resources toward emerging mission requirements.

Question. For the past several years you have heard me and others ring the alarm about water contamination caused by PFAS chemicals in firefighting foam. This public health crisis also hit home for me. The Air Force has been working with communities around Scott Air Force Base in Southern Illinois where PFAS chemicals leached into a drinking water well, and I understand testing continues around the Peoria and Springfield Air National Guard Bases. As you all know, these substances can have a devastating impact on health, and the process is absolutely nerve racking for my constituents.

How much does the Air Force need in fiscal year 2022 to accelerate the process of investigation and cleanup of PFAS across the country?

Answer. The DAF could execute an additional \$49 million in fiscal year 2022 to accelerate investigations and cleanup of PFAS.

QUESTIONS SUBMITTED BY SENATOR DIANNE FEINSTEIN

SPACE TRAINING AND READINESS COMMAND

Question. California is at the center of commercial and military space applications. I was pleased to hear Space Systems Command will be established at Los Angeles Air Force Base. I believe the Space Force should leverage the existing personnel, expertise, and infrastructure available at Vandenberg Space Force Base and the surrounding community for the Space Training and Readiness Command.

What factors is the Air Force considering as part of its decision in locating Space Training and Readiness Command?

Answer. Pending Secretary of the Air Force approval, criteria will consist of mission, capacity, environmental, and cost factors. The Department of the Air Force will also comply with the guidance in 10 USC 483 and the fiscal year 2021 National Defense Authorization Act § 2883.

Question. When do you expect that decision to be made?

Answer. We anticipate Department of the Air Force approval of the criteria in the first quarter of fiscal year 2022.

QUESTIONS SUBMITTED BY SENATOR PATTY MURRAY

FAIRCHILD AFB FUTURE MISSIONS

Question. [full context provided on p. 40–41 of the transcript]

What new missions and assets are you going to bring to Fairchild AFB to continue investing in Fairchild AFB and the community for the long-term? Not only for the KC–46, but other opportunities?

Answer. The Department of the Air Forces uses its strategic basing process to determine locations for new missions. The DAF will continue to consider Fairchild Air Force Base for new missions, dependent on mission requirements and where it meets the enterprise definition of locations eligible for consideration.

QUESTIONS SUBMITTED BY SENATOR BRIAN SCHATZ

FEDERAL CLEAN ENERGY ELECTRICITY STANDARD

Question. [full context provided on p. 29–30 of the transcript]

The president issued an executive order establishing a Federal clean energy standard, electricity standard. It requires all government agencies, including DoD to use their procurement authority to help move the country towards a carbon free electricity sector by 2035. So, can you talk to me about how you're using your procurement authority to comply with the president's executive order? Is there anything you've changed? I'd ask you take another look at: "We've got these authorities, the president is asking us to use those in our daily procurement of energy," and I think that part hasn't quite yet happened. Do you agree with that or you think I'm getting that wrong?

Answer. The Department of the Air Force (DAF) is using all available authorities in the process of procuring a full spectrum of cleaner energy project types. These projects improve our energy posture and empower mission assurance as a critical distributed energy generation source. To expand this procurement of clean energy and the development of energy projects, we are reviewing project execution rates within its installation energy governance structure. The Department is also developing Installation Energy Plans to identify potential opportunities and use all available authorities to develop clean energy projects.

In fiscal year 2020, DAF on-base renewable energy production was 488,136 MWh, including owned and third party owned projects located on Department lands. The DAF continues to utilize authorities provided by Congress, such as Enhanced Use Leases (EULs), to leverage underutilized properties where private developers can construct clean energy systems. In return, the DAF receives a financial benefit, such as reduced energy rates or other in-kind considerations.

The DAF is primarily using third party financed performance contracts, such as Energy Savings Performance Contracts (ESPCs); ESPCs provide the Federal Government with a partnership opportunity to procure energy savings and facility improvements with no up-front capital costs.

The Department is also pursuing a wide range of solar and battery storage projects using performance contracts and Power Purchase Agreements (PPAs) initiatives to enhance energy assurance and resiliency at mission critical installations. At the end of fiscal year 2020, the DAF had 327 renewable energy projects in operation

on 105 sites through a variety of project delivery methods, including PPA, EULs, Energy Resilience Conservation Investment Program (ERCIP), and Military Construction (MILCON).

QUESTIONS SUBMITTED BY SENATOR ROY BLUNT

THE ROLE OF C-130S

Question. Secretary Roth and General Brown, I would like to note my continued concerns about the Air Force's proposed reductions of C-130 Total Aircraft Inventory.

My understanding is that Air Force seeks to cut five flying squadrons as part of an effort to reduce the number of C-130s to approximately 255 planes over the next 5 years, with the majority of reduction coming from the Air National Guard.

I know a number of Senators, including many members of this committee, have articulated the detrimental impact of reducing our national airlift capacity.

Furthermore, the targeted reduction of Air National Guard C-130s would make it difficult—if not impossible—for the Guard to support routine training missions, as well as domestic operations to respond to emergencies and disasters.

If any proposed reductions come from within the Guard C-130 force structure, there will be a significant loss of domestic operations capabilities. As we have seen over the last several years, those domestic requirements are not letting up.

Please provide your perspective on the breadth and depth regarding the role our C-130s play in supporting the requirements of domestic operations.

Answer. The Department of the Air Force agrees that tactical airlift is an integral homeland defense mission. Every state has tactical airlift capacity and there are procedures in place for states to share resources. In addition to the C-130s in the ANG, there are six states unit equipped with 48 C-17s to support Defense Support to Civil Authorities missions. By looking at this fleet in isolation—in isolation from other Air Force missions, or in isolation from the remainder of our airlift fleet—we would fail to appreciate the balance the Air Force needs to strike between capability, capacity, readiness, and modernization across all of our missions.

THE FUTURE C-130 FORCE STRUCTURE AND THE 139TH AIRLIFT WING AT ROSECRANS AIR NATIONAL GUARD BASE

Question. Secretary Roth and General Brown, while the Air Force and Air National Guard have indicated that there will be no reduction of C-130H aircraft at the 139th Airlift Wing at Rosecrans Air National Guard Base, I expressed in a letter last month to you, General Brown, and to Lieutenant General Michael Loh, my concerns should any optional course of action be considered.

As you know, the 139th Airlift Wing supports both the C-130 Weapons Instructor Course and the Advanced Airlift Tactics Training Center. The Air National Guard acknowledged that two C-130s at Rosecrans supporting the Weapons Instructor Course mission were improperly coded as Backup Aircraft Inventory. If the 139th were to lose one of these aircraft, it would lose its ability to conduct these unique and necessary training missions that support the broader Air Force enterprise.

I would appreciate your commitment to ensuring the Air National Guard correctly recodes these aircraft, and confirming your commitment to preserving the vital mission of the 139th Air Wing mission.

Answer. We are committed to preserving the mission of the 139 Airlift Wing (AW) and I assure you aircraft coding is consistent across units which host Weapons Instructor Course (WIC) missions. We recognize the challenges the 139 AW faces as host to the C-130H WIC and Advanced Airlift Tactics Training Center. The 139 AW has the appropriate resources to execute these missions while continuing to perform its operational mission and meet the training needs of assigned aircrew.

QUESTIONS SUBMITTED BY SENATOR JOHN HOEVEN

MH-139 PROCUREMENT REQUESTORS

Question. Your budget request does not include procurement of any MH-139 Grey Wolf helicopters, which are slated to replace the Vietnam-era Hueys at our ICBM bases. I understand that procurement has been pushed back due to Federal Aviation Administration (FAA) certification issues.

Given the delay, how many MH-139s do you project to purchase in fiscal years 2023 and 2024?

Answer. Fiscal year 2023 and fiscal year 2024 quantities are still under review. The MH-139 contract allows for a quantity range of 2 to 16 aircraft per fiscal year.

Question. When should we expect to procure MH-139s that will be based at Minot Air Force Base (AFB)?

Answer. The Minot basing options will depend on an updated buy profile which is currently being developed.

Question. When will MH-139 aircraft arrive at Minot AFB?

Answer. The Minot basing options will depend on an updated buy profile which is currently being developed.

QUESTIONS SUBMITTED TO GENERAL CHARLES Q. BROWN, JR.

QUESTIONS SUBMITTED BY SENATOR JON TESTER

AIR NATIONAL GUARD FLYING SQUADRONS

Question. [full context provided on p. 21 of the transcript]

How many [Air] National Guard squadrons are going to lose flying missions in this [fiscal year 2022] budget?

Answer. We are not intending to close any units and are carefully evaluating several future missions in which the Air Force needs to bring on. Most units will retain a flying mission, but not all. Some squadrons will experience a one-for-one replacement of flying missions (KC-10, KC-135, F-15C), some will be replaced with a mixture of flying and non-flying missions (A-10, E-8), and some flying missions are going away and will be replaced with a non-flying mission (C-130). As we continue to invest in our future force, it is imperative that Air Force manpower be appropriately aligned with new, higher priority, missions or the Air Force cannot modernize against the emerging threat.

QUESTIONS SUBMITTED BY SENATOR RICHARD J. DURBIN

TACTICAL AIRLIFT AIRCRAFT REQUESTORS

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F-15 UPGRADES REQUESTORS

Question. The fiscal year 2022 Air Force budget request includes funding for 12 F-15EX aircraft, and the Unfunded Priorities List includes a funding request for an additional 12 F-15EX aircraft. The request also includes a divestment of 48 F-15C/Ds. The F-15C/D fleet is aging, with high sustainment costs, and many of these aircraft are expected to run out of service life within the next decade.

Can you explain why it's faster, cheaper, and more critical to upgrade to these new F-15s instead of investing in other aircraft?

Answer. With a majority of the F-15C fleet flying beyond designed service life, it is critical that we recapitalize units with modern fighters as quickly as possible. The F-15EX was developed from a provided design, with significantly upgraded systems, using funds from Foreign Military Sales customers. The purchase of these aircraft offered the Air Force an opportunity to augment F-35 purchases and quickly recapitalize these units.

QUESTIONS SUBMITTED BY SENATOR PATRICK LEAHY

AIR FORCE READINESS IMPROVEMENTS

Question. Given the administration's priority of taking care of our people, and the important role that unit cohesion plays in improving readiness, it is crucial that the Air Force take a fresh look at policies and practices that may not support all service members. To that end, please outline what changes, if any, the Air Force has made, is making, plans to make, or is considering in order to:

Improve diversity in leadership positions;

Answer. To improve diversity in leadership positions, the Department of the Air Force has taken a holistic review of potential barriers to development and inclusion. Adjustments have been made to uniform and appearance policies and several adjustments have been made to help improve deliberate development of diverse leaders. One such area was the DAF establishment of diversity requirements for Key Developmental Slates. The purpose of this initiative is to promote greater opportunity and consideration among qualified candidates, who offer diverse perspectives and represent diverse backgrounds and experience. This initiative will require that the pool of Airmen considered for key military developmental positions and nomination assignments (e.g. Aide-de-Camp, Military Assistant, Executive Officer, Career Field Manager, Senior Enlisted Advisor, Commander's Action Group member) include qualified, diverse candidates based on gender, race and/or ethnicity.

Question. Improve diversity retention at all levels;

Answer. To assist with improving diversity retention the Department of the Air Force has identified and began removing disparate policies, procedures, barriers and other cultural practices that may be unfairly impacting the retention of Airmen and Guardians. These changes include revisions to dress and appearance regulations, expanding child/career balancing options such as deferring the decision to separate 12 months post birth, expanding parental leave, and continued utilization of the Career Intermission Program (CIP). Since CIPs establishment in 2014, 54 percent of all participants have been female and 99 percent of the Airmen who completed the program have returned to service. The Department of the Air Force acknowledges that diverse, resilient, and ready Airmen and Guardians (both military and civilian) are the core of the Department's present and future readiness and lethality.

Question. Improve trainings, including sexual assault prevention, with input from women, LGBTQ service members, BIPOC service members, and sexual assault survivors;

Answer. The Department of the Air Force is committed to improving training that improves the lives all of our diverse Airmen and Guardians while promoting a sense of belonging to the DAF. The DAF is working hard to ensure our training is evidenced based and includes considerations of and input from many vulnerable populations including women, LGBTQ service members, BIPOC service members, and both male and female sexual assault survivors. We are working closely with the DoD Independent Review Commission on Sexual Assault in the Military and the DAF Interpersonal Violence Taskforce; and we have developed a prevention plan of action to improve prevention efforts that provide a foundation for concrete actions to address interpersonal and self-directed violence. We are committed to providing a respectful, inclusive environment for all Airmen and Guardians, and taking all appropriate steps to improve.

Question. Increase availability and accessibility of mental health support services for Service members and their families, including services tailored specifically toward minority service members;

Answer. To maximize the availability of our mental health services, the Department of the Air Force (DAF) has sought to create mental health clinic workflows to match patient needs and increase efficiencies. Through the 2020 COVID-19 lockdown period, the DAF expanded its tele-mental health services 3600 percent compared to 2019. As a result, the DAF mental health enterprise was able to sustain 90 percent of its 2019 care operations levels during this period.

Furthermore, in order to improve readiness and support of Airmen who are minority service members, the Air Force Surgeon General established an Office of Diversity and Inclusion. This office is actively working with the Defense Health Agency to evaluate and intentionally address any identified disparities in healthcare delivery.

Question. Improve outreach to and support for minority service members facing discrimination from within their units; and

Answer. The Department of the Air Force continues to evaluate and refine the Out and About outreach program used to gather equal opportunity and human relations information that may impact service members.

The Installation Equal Opportunity Director is responsible for scheduling Out and About Assessments in coordination with unit leadership and ensures unit leadership receives a summary of observations following the assess. Observations and discussions focus on EO, human relations and organizational effectiveness factors that impact morale and mission readiness to include, but are not limited to: Interpersonal communication/interaction/polarization (break rooms, work areas, recreation/entertainment facilities, etc.); Accessibility to unit leadership; Bulletin board and public display items (individual/group recognition, policy letters/posters, etc.); Workplace conditions/environment; Dormitory conditions/environment; Graffiti; Personal display of pictures, posters, artifacts, etc.; and overall general impressions. Information gathered throughout the assessment is used as part of the overall Organizational Climate Assessment Program.

Question. Improve medical care for transgender service members, women, and Black parents, particularly for transition care, pregnancy, and post-partum care.

Answer. In order to improve readiness and support of Airmen, the DAF established a Transgender Health Medical Evaluation Unit (THMEU) at Lackland Air Force Base, Texas. The THMEU operates under a patient-centered care model that ensures compliance with Department of Defense (DoD), DAF, and Defense Health Agency policies and transgender healthcare clinical guidelines, regardless of where patients are located.

In addition to the THMEU, the Air Force Surgeon General established an Office of Diversity and Inclusion Office to improve readiness and support of Airmen who are minority service members. This office is also working with the Defense Health Agency to evaluate and intentionally address disparities in healthcare delivery, which would include pregnancy and postpartum care.

On top of these efforts, the DAF is also focused on improving the pregnancy and postpartum care provided to Airmen, particularly with a focus on return to duty and readiness. For example, Air Force Instruction on Duty Limiting Conditions (48-133) was updated to allow fitness assessment exemptions following perinatal loss (miscarriage and stillbirth). A parallel update regarding convalescent leave after such losses is currently pending revisions to Air Force Manual on Tricare Operations and Patient Administration (41-210). Additionally, updates were made to breast feeding policies (AFGM2020-36-01) to improve Airmen and Guardians access to breast pumping resources and milk storage, as well as increase flexibility in scheduling pumping time during the duty day.

Furthermore, in order to better address the needs of Airmen following pregnancy and birth of a newborn, the DAF is working on a multidisciplinary approach to comprehensive postpartum care and reintegration. At select locations (currently Nellis AFB, expanding to Seymour Johnson AFB and Joint Base Langley-Eustis), DAF Units are piloting a program facilitating comprehensive Airmen and Guardian fitness during pregnancy and in postpartum. This program includes fitness classes, lactation support, mental health, wellness screening and access to services such as physical therapy and nutrition.

In addition to the efforts mentioned above, the Air Force Medical Service and the Defense Health Agency are working together on implementing the latest evidence-based perinatal care services at military treatment facilities. Across the Military Health System, postpartum bleeding procedures were established to improve maternal and neonatal outcomes. New guidance was also developed to standardize ultrasound examinations to improve the identification of abnormal findings. Moreover, a Defense Health Agency review board was established to review cases of severe maternal harm in order to identify areas of improvement. Finally, a working

group was established to identify and address any racial disparities in obstetric outcomes, unconscious bias education, and cultural competency in maternity care.

QUESTIONS SUBMITTED BY SENATOR JOHN HOEVEN

RQ-4 GLOBAL HAWK REQUESTORS

Question. The budget request proposes to divest the Block 30 version of the Global Hawk but continues to fund operations for the Block 40 version.

Do you forecast operating the Block 40 Global Hawk throughout the five year budget window?

Answer. Yes, upon retirement of 20 RQ-4 Block 30s in fiscal year 2022, the Air Force plans to operate and sustain the remaining 10 RQ-4 Block 40s through the fiscal year 2021 FYDP (fiscal year 2021–fiscal year 2026).

MINOT AFB WEAPONS GENERATION FACILITY

Question. [full context provided on p. 38–39 of the transcript]

When will Minot AFB Weapons Generation Facility construction start?

Answer. While we can't commit to a specific year when we will request funding, the AF is committed to replace the Weapons Storage Area (WSA) at Minot with a Weapons Generation Facility (WGF). Since the weapons generation facilities are new designs that incorporate current safety and surety standards, they are complex structures. Minot's is even more complex because it will house assets for multiple weapon systems—both for missiles and assigned bombers. We are learning valuable lessons from the two facilities currently awarded, which will help us design and build the more complex facility at Minot effectively. These lessons learned will incorporate cost effectiveness in the Minot WGF.

QUESTIONS SUBMITTED TO GENERAL JOHN W. RAYMOND

QUESTIONS SUBMITTED BY SENATOR PATRICK LEAHY

SPACE FORCE READINESS IMPROVEMENTS

Question. Given the administration's priority of taking care of our people, and the important role that unit cohesion plays in improving readiness, it is crucial that the [Space] Force take a fresh look at policies and practices that may not support all service members. To that end, please outline what changes, if any, the [Space] Force has made, is making, plans to make, or is considering in order to:

Improve diversity in leadership positions;

Answer. To improve diversity in leadership positions, the United States Space Force (USSF) is taking intentional steps in the following areas:

—Leveraging the platform of Selection Boards to increase diverse representation, including:

—Senior Enlisted Leader Development Teams (SEL DT) for Command Chief Boards (CCB)

—Development Teams for Squadron Command and Director of Operations Boards

—Command Screening Boards for Delta and Garrison Command positions

These efforts have begun to yield positive results such as 75 percent of the new Chiefs from the SEL DT and 32 percent of the new Commanders from the CSB are of diverse representation.

—Increasing diversity and inclusion acumen among USSF leadership through education improving diversity and enhancing team performance skills. Current courses include:

—Pre-Command Course

—Squadron Command Course

—Senior Leadership Officer Course

—Expanding Project Aristotle across the Force rather than for just one targeted Guardian population." Project Aristotle is a homegrown USSF program that has two distinct goals: (1) Match USSF General Officers (Development Coaches) with every O-6 Guardians (Mentees) to grow USSF senior leaders into strategic leaders that can lead brilliantly across a dynamic environment—deliberately focusing on human and soft skills growth; (2) Assist with placement of an extremely capable and diverse O-6 candidate pool into the right USSF assignment at the right time. Currently, all of my O-6 and O-6 (Select) Guardians are

matched with a general officer. Moving forward, the USSF plans to expand the program more broadly across the force.

- Revising the entire O-6 management process to handle the development and assignment of each officer individually.

Question. Improve diversity retention at all levels;

Answer. The United States Space Force is fostering a culture that is resilient and inclusive. Through the integration of evidence-based best practices and benchmarks, we aim to create a work environment that is cohesive and collaborative. The following have been implemented:

- Recently signed policy to establish diverse pool for candidates on non-statutory boards. This initiative develops our Guardians, enhances retention, and serve as a developmental experience helping prepare members for future Senior Leadership opportunities.
- Space Force Chief Human Capital Officer co-leads the Department of the Air Force Barrier Analysis Working Groups, alongside the Air Force's Office of Diversity and Inclusion (SAF/ODI) and Manpower, Personnel and Services (AF/A1). These senior leaders provide oversight of various affinity groups to include but not limited to the Women's Initiative Team, Hispanic Empowerment Action Team and the Black Employment Strategic Team. These groups provide an environment conducive to networking, enhancing belonging, and raising concerns or issues affecting these populations to Senior Departmental leadership for awareness, guidance, and actions.
- Initiated formal intern programs, expanding access to new talent, supporting Space Force's contributions to National Defense, while growing Space-related competencies and retaining diverse talent. Two programs being used are:
 - Premier College Intern Program. These interns are college majors in Computer Science, Cyber, and Information Systems programs.
 - Arnold Air Society and Silver Wings Intern Program, which provides Reserve Officer Training Corps (ROTC) cadets the opportunity to conduct their summer intern program within USSF. The objective is to allow access to the cadets to learn new skills and increase their knowledge on the space mission and contributions to National Defense.
- Executed Space Force's first-ever Sword Athena titled "Women In Space." Sword Athena provides female Guardians a professional development forum and networking mechanism. It was deliberately designed to inform, inspire and motivate Guardians.
- Partnered with Air Force Recruiting Service (AFRS) to establish a dedicated cadre of recruiters to conduct targeted Guardian recruitment in underrepresented communities. These dedicated recruiters will brand the USSF, while educating and informing potential applicants, influencers, and civic leaders about the benefits of becoming a Guardian, and why the USSF should be considered a premium career choice.
- Established the University Partnership Program (UPP), promoting diversity through partnerships with diverse institutions, including Historical Black Colleges and Universities (HBCUs) and Minority Serving Institutions (MSIs). Under UPP, the USSF will provide educational scholarships and commissioning opportunities to underrepresented members attending select universities. Additionally, the USSF is establishing Junior Reserve Officer Training Corps units at selected high schools to seed opportunities in underrepresented communities.
- Focused Space Force military and civilian recruitment initiatives on expanding the pool of potential STEM applicants from a diverse cross-section of our nation by leveraging partnerships with academia, industry, and other government agencies that promote and provide opportunities for underrepresented groups to pursue science and technology-focused degrees and career opportunities.

Question. Improve trainings, including sexual assault prevention, with input from women, LGBTQ service members, BIPOC service members, and sexual assault survivors;

Answer. The Space Force is committed to improving training that improves the lives all of our diverse Airmen and Guardians while promoting a sense of belonging to the Space Force. The Space Force is working hard to ensure our training is evidenced based and includes considerations of and input from many vulnerable populations including women, LGBTQ service members, BIPOC service members, and both male and female sexual assault survivors. We are working closely with the DoD Independent Review Commission on Sexual Assault in the Military and the Interpersonal Violence Taskforce; and we have developed a prevention plan of action to improve prevention efforts that provide a foundation for concrete actions to address interpersonal and self-directed violence. We are committed to providing a re-

spectful, inclusive environment for all Airmen and Guardians, and taking all appropriate steps to improve.

Question. Increase availability and accessibility of mental health support services for Service members and their families, including services tailored specifically toward minority service members;

Answer. To maximize the availability of our mental health services, the Department of the Air Force (DAF) has sought to create mental health clinic workflows to match patient needs and increase efficiencies. Through the 2020 COVID-19 lockdown period, the DAF expanded its tele-mental health services 3600 percent compared to 2019. The DAF mental health enterprise was able to sustain 90 percent of its 2019 care operations levels during this period.

Furthermore, in order to improve readiness and support of Guardians, the Air Force Surgeon General established an Office of Diversity and Inclusion. This office is actively working with the Defense Health Agency to evaluate and intentionally seek to correct disparities in healthcare delivery.

Question. Improve outreach to and support for minority service members facing discrimination from within their units; and

Answer. The Space Force continues to evaluate and refine the Out and About outreach program used to gather equal opportunity and human relations information that may impact service members.

The Installation Equal Opportunity Director is responsible for scheduling Out and About Assessments in coordination with unit leadership and ensures unit leadership receives a summary of observations following the assessments. Observations and discussions focus on EO, human relations and organizational effectiveness factors that impact morale and mission readiness to include, but are not limited to: Interpersonal communication/interaction/polarization (break rooms, work areas, recreation/entertainment facilities, etc.); Accessibility to unit leadership; Bulletin board and public display items (individual/group recognition, policy letters/posters, etc.); Workplace conditions/environment; Dormitory conditions/environment; Graffiti; Personal display of pictures, posters, artifacts, etc.; and overall general impressions. Information gathered throughout the assessment is used as part of the overall Organizational Climate Assessment Program.

Question. Improve medical care for transgender service members, women, and Black parents, particularly for transition care, pregnancy, and post-partum care.

Answer. In order to improve readiness and support of Guardians, the DAF established a Transgender Health Medical Evaluation Unit (THMEU) at Lackland Air Force Base, Texas. The THMEU operates under a patient-centered care model that ensures compliance with Department of Defense (DoD), DAF, and Defense Health Agency policies and transgender healthcare clinical guidelines, regardless of where the Guardian is assigned.

In addition to the THMEU, the Department of the Air Force Surgeon General established an Office of Diversity and Inclusion Office to improve readiness and support of Guardians who are minority service members. This office is also working with the DHA to evaluate and intentionally address disparities in healthcare delivery, which would include pregnancy and postpartum care.

On top of these efforts, the DAF is also focused on improving the pregnancy and postpartum care provided to Guardians, particularly with a focus on return to duty and readiness. For example, Air Force Instruction on Duty Limiting Conditions (48-133) was updated to allow fitness assessment exemptions following perinatal loss (miscarriage and stillbirth). A parallel update regarding convalescent leave after such losses is currently pending revisions to Air Force Manual on Tricare Operations and Patient Administration (41-210). Additionally, updates were made to breast feeding policies (AFGM2020-36-01) to improve Guardians' access to breast pumping resources and milk storage, as well as increase flexibility in scheduling pumping time during the duty day.

SUBCOMMITTEE RECESS

Senator TESTER. Next week, the full Appropriations Committee will hear testimony from the Secretary of Defense and Chairman of the Joint Chiefs of Staff. That will be on June 17th at 10 a.m.

This Defense Subcommittee will reconvene on Tuesday, June 22 at 10 a.m. to hear from the Army leadership on the fiscal year 2022 Army budget request.

And with that, this committee stands in recess.

[Whereupon, at 3:31 p.m., Tuesday, June 8, the subcommittee was recessed, to reconvene at 10 a.m., Tuesday, June 22.]

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 2022

TUESDAY, JUNE 22, 2021

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 10 a.m., in room 192, Dirksen Senate Office Building, Hon. Jon Tester (chairman) presiding.

Present: Senators Tester, Leahy, Baldwin, Shaheen, Shelby, Murkowski, Blunt, Moran, Hoeven, and Boozman.

DEPARTMENT OF DEFENSE

DEPARTMENT OF THE ARMY

OFFICE OF THE SECRETARY

STATEMENT OF HON. CHRISTINE E. WORMUTH, SECRETARY

OPENING STATEMENT OF SENATOR JON TESTER

Senator TESTER. Good morning. Let me begin by welcoming our witnesses. Christine Wormuth was recently confirmed as the 25th Secretary of the Army. She is no stranger to breaking barriers, and I look forward to working with her to tackle the tough issues in store over the coming years. General James McConville is the 40th Chief of Staff of the Army. He is a war fighter first, having received too many awards and decorations to list in this short opening statement. His expertise as a distinguished helicopter pilot makes him uniquely qualified to help oversee the Army's current aviation modernization efforts. General, I want to thank you for your service, and we look forward to your testimony.

As we continue our efforts to confront growing threats from abroad, the Army has recognized the need to become a more distributed and agile force. In plain English, this means being able to fight on the move, across the ground, air, sea, space, and cyber domains. There is always more room to collaborate with other services working in these domains, and I commend the Army for embarking on a historic change in how it will fight the wars of the future. To do this, the Army is on an aggressive pursuit of modernization, including ground combat vehicles, soldier lethality, aviation, and long range attack capabilities. The Army has tried this before, the last two decades, tens of billions spent on R&D programs, but we have little to show for it.

Today, we are beginning to see these modernization programs not only in advanced development stages, but also initial produc-

tion. Secretary Wormuth and General McConville, this is promising news. And I ask you to keep the Army on this good track. The Army's budget took an overall top line reduction, but still increased investment in its top priorities. As a subcommittee, we need to know whether the dollars in this budget are enough to continue development and increase production on all of these new capabilities without jeopardizing today's readiness.

We must also look down the road a few years and ask if the Army is prepared to afford all these new systems that they are getting ready to procure. High tech weapons are expensive, and we must be able to buy them fast enough if budgets remain stable. Once again, I want to thank Secretary Wormuth and General McConville for appearing here today. I look forward to your testimony and perspective on the fiscal year 2022 budget. Senator Shelby.

STATEMENT OF SENATOR RICHARD C. SHELBY

Senator SHELBY. Thank you, Mr. Chairman. Secretary, warmest welcome to your first hearing before our subcommittee in your new role. Congratulations. General McConville, thank you also for being here. You are no stranger to this place. I look forward to hearing about the Army's budget proposal for 2022. This discussion is particularly important, I believe, because the Army's budget proposal reflects a 2 percent reduction from fiscal year 2021.

The reduction is proposed despite the need to maintain readiness and make progress on key modernization priorities like the long range hypersonic missile and improve lethality capabilities. You are both well aware that our adversaries, including China and Russia, pose new and increasing threats that erode our traditional technological and battlefield advantages. They are making unprecedented investments in their capability and capacity. And China specifically has stated—has a stated object of surpassing us by the middle of the century. They made a lot of progress.

We can't let them do that though. Given that the overall funding request for the Department of Defense does not keep pace with inflation, and the Army budget proposal reflects a decrease from last year, I am concerned that we are sending the wrong message to both our allies and our adversaries. I look forward to hearing today regarding the 2022 budget request and I look forward to question and answer time. Thank you.

Senator TESTER. Thank you, Senator Shelby. We will start out with your testimony, Secretary Wormuth.

SUMMARY STATEMENT OF HON. CHRISTINE E. WORMUTH

Secretary WORMUTH. Chairman Tester, Vice Chairman Shelby, distinguished members of the committee, thank you so much for your continued support for our Army and our people, and thank you for the warm welcome today. I am very glad to be here. It is a real privilege to be with you today, and I would like to very honestly and earnestly take a moment to thank General McConville for his lifetime of service to our Army and to our Nation. In my about month of time in the job, he has been a great partner and we are off to a running start.

I am honored to be serving as the Secretary of the Army and to be working with Secretary Austin and Deputy Secretary Hicks once again. I thank them for their continued leadership. As I have stepped into the role, I am surprised—I am impressed but not surprised to see the State of our Army and its professionalism, the hard work of our soldiers and families, and the continued sacrifice that our soldiers and leaders make every day as part of our—the world's greatest land fighting force. I would like to highlight a few key observations on the state of our Army as I see them today.

First, the Army must continue to heavily invest in the development of its people. People are the strength of our Army. We are steadily working to enhance our force structure, build inclusive leadership, and invest in quality of life initiatives. Like my predecessors, I can assure you that the character, culture, and climate within our formations at every installation will reflect a continued focus on placing people first.

The harmful behaviors of sexual assault and harassment, racism, and extremism cannot and will not be tolerated. We will purposefully work to stem the tide of suicides that we have experienced in our Army in the last few years. Our responsibility is to ensure every soldier and civilian has the right leadership, policies, and resources to be safe and successful among their teams so that they can continue to be successful in our Nation's defense. Second, the Army is now a leader in new technology. From Army future's command to cross-functional teams to the Rapid Capabilities and Critical Technologies Office, to fielding next generation soldier equipment for individual unit members, the Army is prototyping and experimenting with new capabilities and concepts.

The Army is at the forefront of developing and fielding new technology in counter UAS (Unmanned Aircraft Systems) directed energy, hypersonic weapons, next generation assured positioning navigation and timing devices, pushing software coding to the edge, and many other areas. Third, the Army is opening doors in the Indo-Pacific, Europe and beyond. The Army can be relied upon to engage with our allies, foster partnerships, maintain deterrence, and set conditions for success prior to or while engaging in conflict.

Deterrence requires boots on the ground, and our Department of Defense must be present to succeed in crisis. The Army is recognized as an enduring, reliable partner that can directly contribute by bringing resources, training, and expertise to countries in regions around the world. Our partnership can lay the groundwork for access and cooperation and contingencies in crisis. Fourth, the next fight will be in all domain conflict. Future conflict will be in across all domains with ground forces to secure terrain, penetrate defenses, and achieve objectives. The Army's transformation is directly aimed at supporting joint war fighting that will depend on joint all domain command and control, expeditionary joint logistics, and joint maneuver across domains.

As the Army continues to modernize, we will maintain our overmatch against near peer adversaries, helping make future conflict less likely by ensuring that the cost to our adversaries outweigh any benefit. And finally, the Army's readiness, gains, and modernization procurement requirements must be prioritized to continue. The Army recognizes the need to modernize concepts and ca-

pabilities to sharpen our global competitive edge. Working in close coordination with you all in Congress, we established a deliberate, achievable path to deliver a ready, modernized Army.

Significant progress has been made, but success can only be assured through continued transformation. The Army has already made and will continue to make tough decisions to ensure the best use of resources to adapt to and stay ahead of the capabilities of our adversaries, whether they are near peer nations or newly emerging threats. The Army will also compete successfully below the threshold of conflict. The President's budget will help us to care for our people, maintain and enhance our readiness, and innovate and modernize. With your continued support, we will pivot to next generation capabilities to ensure we can win now and in the future.

Our Army is in great shape, but we have important work ahead. I want to use this window of opportunity in the next few years to make certain that the Army will continue to provide modernized and ready forces capable of responding globally.

I join General McConville in striving to ensure we provide the Army with the resources it needs to succeed. I know the Chief is eager to share his thoughts as well, and I look forward to your questions. Thank you.

Senator TESTER. Thank you, Secretary Wormuth. General McConville.

STATEMENT OF GENERAL JAMES C. McCONVILLE, ARMY CHIEF OF STAFF

General McCONVILLE. Well, thank you. And I would like to thank the Secretary for her leadership during this critical time in the Army. Chairman Tester, Vice Chair Shelby, distinguished members of the committee, thank you for the opportunity to be here today and your continued support for our Army and our people, our soldiers, our families, our civilians, and our soldiers for life, our retirees and veterans.

The Army currently has 485,000 active duty soldiers in a little more than 1 million in the total force. That is roughly the same size Army that we had on 9/11. Army soldiers are presently supporting combatant commanders around the world and in more than 140 countries. They form the most lethal and decisive land force in the world, and they stand ready to fight and win the Nation's wars as part of the joint force. I could not be more proud of each and every one of them.

Since last October, the Army's priorities have been people, readiness, and modernization, making us well aligned with emerging national security guidance. Putting people first means recruiting and retaining the best talent our Nation has to offer, maximizing their potential, and taking care of them. We are building a culture of cohesive teams that are highly trained, disciplined, and fit where everyone is treated with dignity and respect. And that is how we prevent the harmful behaviors that hurt our soldiers and break trust with the American people. These being sexual assault and harassment, acts of racism, extremism, and death by suicide.

All three of my children, two sons and a daughter, plus my son in law, are currently serving in the Army. Providing a safe and secure environment for our soldiers is not only my responsibility as

chief of staff the Army, it is also a deeply held personal commitment. We win through our people. The best fighting forces in the world ensured their soldiers and units are masters of their craft. That is why we are shifting to a foundational readiness model that prioritizes training at the company level and below first.

The Army has rebuilt a high level of readiness with the support of Congress, but that readiness level is fragile. We must sustain that high level of readiness while continuing our most comprehensive transformation and modernization efforts in over 40 years. That is the only way we will maintain our overmatch against our near peer competitors and would be adversaries. This year, we are turning our multi domain operations concepts into real doctrine. We are not only developing but delivering on our six modernization priorities, including our 31 plus 4 signature systems.

With new doctrine, organizations, and equipment, the Army is offering multiple options to combatant commanders and multiple dilemmas to competitors and adversaries. And we are doing so alongside our sister services and alongside our allies and partners. The U.S. Army never fights alone. We are the strongest land force in the world and a great source of that strength comes from our allies and partners. As a people based organization, we are uniquely qualified to foster these relationships.

Thank you for your continued support to America's sons and daughters in uniform. I look forward to your questions.

[The statement follows:]

PREPARED STATEMENT OF HON. CHRISTINE E. WORMUTH
AND GENERAL JAMES P. McCONVILLE

EVOLVED PRIORITIES

America's Army remains prepared to compete globally and fight and win the Nation's wars as a member of the Joint Force. As demonstrated repeatedly over the past year, we also remain the Nation's principal response force to protect our country and communities in the face of unexpected crises. We thank Congress for the consistent, predictable, and sustained funding you have provided. This funding enabled us to deliver a ready Army that responded promptly and superbly to a dynamic and unpredictable security environment, like the COVID-19 pandemic, Middle East tensions, civil unrest, cyberattacks, and south-west border mission. Our priorities are well aligned with the Interim National Security Strategic Guidance: investing in people, sustaining readiness, divesting of legacy systems to reinvest in cutting edge technologies and capabilities, mitigating the impact of climate change, and strengthening our alliances and partnerships.

Last October, the Army evolved its priorities to people, readiness, and modernization. This evolution reflects the achievements of a multi-year effort to rebuild readiness and accelerate modernization. Six years ago, we recognized that readiness had declined precipitously after years of reduced funding, uncertain budgets, and deferred modernization. We also recognized the need for new concepts, capabilities, and posture to compete aggressively in the Indo-Pacific and Europe. With your support, we rebuilt tactical readiness in our units and built strategic readiness in our power projection infrastructure. We deliberately executed internal reforms over the last four years by realigning over \$35 billion within the Army budget to self-fund modernization priorities in support of joint all-domain operations.

Thanks to your continued support for Army modernization, we are successfully pivoting from the incremental improvements of the past to fulfilling the robust Army Modernization Strategy that Congress prescribed in the 2018 National Defense Authorization Act. Because of this strategy, and new Congressional authorities to streamline the acquisitions process, we are already beginning to field new systems in long-range precision fires, air and missile defense, and soldier lethality, with more on the way in next generation combat vehicles, future vertical lift, and the Army network. With these modernization capabilities, we are able to deliver multi-domain concepts, capabilities, and formations that will give the Joint Force

asymmetric, all-domain advantages against near-peer potential adversaries. Our gains are real, but fragile. With Congressional support, we established a deliberate achievable path to deliver a ready and modernized Army by 2028 and a transformed multi-domain Army by 2035. However, sustaining today's readiness and modernizing for tomorrow's readiness is only possible through your timely, adequate, predictable, and sustained funding.

STRATEGIC ENVIRONMENT

A dynamic global security landscape continues to challenge our nation. These challenges include: (1) borderless threats, like COVID, cyber, violent extremism, and climate change; (2) the global siege on democracy to include an increasingly contested information environment; and (3) the changing distribution of global power that draws new lines and value propositions for many of our allies and partners. These challenges require an agile, ready, modern, and multi-domain Army that works alongside strong allies and partners. Strategic competitors and regional actors are testing American norms, institutions, and alliances. China, our pacing threat, increases its global assertiveness, while Russia increases its disruptive behavior. Threats from Iran, North Korea, and violent extremism and terrorism remain. While America's Army maintains a tenuous overmatch, it is fleeting. Future conflicts will manifest at longer range, across all domains, and at much greater speed, both physically and cognitively.

Climate change is altering the Army's operational environment and adding new mission demands; mitigating these effects has been an ongoing priority for the Army for several years. Climate change impacts Army installations globally and opens the Arctic as a new geographic theater for competition. The Army must consider alternative energy sources, improved energy storage, fuel-efficient design, more robust power distribution, and new technologies, such as weather pattern and terrain stability modeling to better inform operations.

The Army must also contend with threats from within. The harmful behaviors of sexual assault, sexual harassment, racism, and extremism hurt Soldiers and break trust with the American people. The Army is working diligently to solidify a culture of cohesion and intervention to protect our Soldiers, not only from the deliberate fratricide of these behaviors, but from the invisible danger of mental and behavioral health issues, and other stressors that can increase the risk of suicide.

PEOPLE FIRST

Listening to Soldiers led to our very deliberate decision to re-align our priorities. The Army's number one priority is now people. Our people are our Soldiers from the Active, Guard, and Reserve components, Army families, Army civilians, and retiree and veteran Soldiers for Life. At every echelon, the Army must promote and build cohesive teams (1) that are highly trained, disciplined, and fit, (2) that are ready to fight and win, and (3) in which each person is treated with dignity and respect. Cohesive teams are the foundation of all our people initiatives and how the Army can best sustain readiness and transform for the future. Three critical enablers from the 2019 Army People Strategy continue to set conditions for putting people first: Army Culture, Quality of Life initiatives, and a 21st Century Talent Management System.

Army Culture

Last December, the Army stood up the People First Task Force to address and implement the 70 Fort Hood Independent Review Committee recommendations, with the understanding that the issues identified are not unique to a single installation. Army leaders are stewards of a special bond of trust and confidence with the American people. We held accountable those leaders deemed to have broken that trust. We have fundamentally transformed our command selection process in order to improve the way we choose future leaders to assume positions with the most influence over Soldiers. We are piloting independent climate assessment teams of subject matter experts to identify unit climate trends early and respond before systemic problems emerge. We are listening to our people to learn and lead better. We conducted 96 listening sessions across 14 locations in addition to a special "Solarium" conference that asked junior- and mid-career leaders to develop solutions. The Army is now working to change policies and aspects of Army culture that impede prevention and response to harmful behaviors. The first policy change introduced "absent—unknown", an additional duty status code which affords missing Soldiers oversight not present in "Absent Without Leave (AWOL)."

"This is My Squad" is the foundational principle for Army culture. This initiative, led by the Sergeant Major of the Army, promotes cohesion by encouraging Soldiers

to better know those around them, develop greater compassion, and intervene early to protect others. Implementation actions include increased non-commissioned officer professional military education, redistribution of experienced leaders, and better reception processes for integrating new Soldiers at each installation and unit.

Project Inclusion is a holistic effort to improve diversity, equity, and inclusion across the force. As of March of this year, the Army had conducted 83 Project Inclusion listening sessions with over 4,700 attendees. Separately, the Army reviewed its policy on official photos and removed official photos from all promotion boards. The Army later redacted race, ethnicity, and gender data from Soldier Record Briefs in accordance with the Secretary of Defense's direction. The Army is building relationships with influencers in diverse cities and communities to better acquire, develop, employ, and retain the best talent across the entire nation.

Quality of Life (QoL) Initiatives

Putting people first also means creating a duty and installation environment that allows Soldiers to thrive. The Army continues to prioritize the QoL focus areas identified in 2019. The COVID era only reinforced how essential each of those initiatives is to the well-being and readiness of our Soldiers and their families.

Housing and Barracks. We continue executing the Army Housing Campaign Plan to shape policies, procedures, and processes at every echelon. The Army implemented 14 of the 18 tenets of the Tenant Bill of Rights in its Residential Communities Initiatives (RCI) projects. We expect the remaining four (common tenant lease, 7-year maintenance history, dispute resolution and rent segregation) to be available at the majority of installations with privatized housing by June 1, 2021. We implemented mechanisms that hold privatized companies accountable to residents for proper maintenance and customer service, hired additional personnel to provide quality assurance oversight, and implemented 100 percent change of occupancy inspections and quality assurance checks. To address environmental hazards (mold and lead), we developed educational materials, a response registry, and policies for habitability and displaced residents. Through the RCI, we are committing over \$1.8 billion and reinvesting another \$1 billion to improve residential housing. Additionally, the Army is projected to invest over \$10 billion in the next 10 years, in both Restoration & Modernization and Military Construction funds, which will renovate or replace more than 1,200 barracks for all components and eliminate sub-standard barracks.

Healthcare. Army Medicine is partnering with the Defense Health Agency to deliver the best care for our beneficiaries across our installations. We are focusing on readiness as the Military Health System reforms. We will emphasize operationally oriented training, modernized capabilities, and innovative operational concepts. We are grateful to Congress for increases in Health Professional Officer special pay caps. This necessary investment ensures Army Medicine can recruit and retain the best quality healthcare professionals for the sustainability of the force.

Childcare. Childcare professionals serve on the front line of the Army's response to the COVID-19 pandemic as they allow mission essential personnel to maintain Army readiness. The Army has a multi-pronged strategy to maintain, and in some cases, increase access to care. With continued Congressional support, we plan to build 21 additional Child Development Centers by FY30, adding approximately 4,000 spaces.

We appreciate Congressional support for the three centers funded in FY21, two in Hawaii and one in Alaska. We continue to invest in these professionals, adjusting compensation to recruit and retain quality staff. We are incentivizing the family child care program, like a \$1,000 bonus for new providers and for families that stay in the program after a move. We implemented revised DoD priorities for childcare to grant more access to military families. Finally, we continue to invest in fee assistance to buy down the cost of off-post care when on-post care is unavailable.

Spouse Employment. With the support of Congress, the Army continues to make improvements in spouse employment. The Army reimburses up to \$1,000 for professional licensing and certification in a new state, with Army Emergency Relief offering an additional \$2,500. We thank Congress for its efforts to bolster the support of individual states in granting reciprocity. We streamlined the Home-Based Business application and approval system, improved policies for military spouse hiring preference, strengthened the Employment Readiness Program, and made the transfer of non-appropriated fund employees between installations easier. We continue to work with the Office of the Secretary of Defense (OSD) to promote workforce development scholarships, improve state license reciprocity and professional license compacts, and reduce overseas employment barriers.

Permanent Change of Station (PCS) Moves. Soldiers are now receiving PCS orders an average of 120 days before their report date, an improvement of 30 to 90 days.

Families can now claim 100 percent of their costs for reimbursement when conducting a personally procured move. Our development and launch of the “Army PCS Move” app and automation of several business processes, including the Smart Voucher program, are helping families research, book movers, track progress, and file claims, expediting reimbursement. Though COVID-19 heavily impacted last summer’s peak PCS season, we still executed over 70,000 moves with a 95 percent satisfaction rate.

21st Century Talent Management System

The Army continues to refine and implement its 21st Century Talent Management System in order to effectively acquire, develop, employ, and retain talent. We are maximizing the potential of each Soldier. We are evolving our marketing and recruiting with initiatives like Army Hiring Days and the “What’s Your Warrior?” campaign to bring in the best talent from across the country, including cities and communities with populations who may be unfamiliar with the opportunities military service affords. This year the Army launched cutting-edge digital talent initiatives. Our Army Artificial Intelligence Center partners with Carnegie Mellon University to grow data engineers and data technicians, while our Software Factory leverages the extraordinary existing talent in our Army to grow coders to solve Army problems.

At the heart of the Army’s 21st Century Talent Management System are new approaches, systems, and processes that leverage deep data about unit needs and Soldier knowledge, skills, behaviors, and preferences. The Integrated Personnel and Pay System—Army (IPPS-A) is on track to go live across all three components by the end of this calendar year. Release 2 is complete, having brought IPPS-A to the Army National Guard across 54 states and territories. Release 3, currently in testing, will integrate the active and reserve forces and complete the Army’s transition to a single system across all components capable of identifying needed talent and managing Soldier careers from accession to transition.

Talent management starts with having the right Army leaders at the battalion and brigade-level. These are the Army’s most consequential leadership positions in terms of affecting retention and attrition. In the biggest change to the Army’s command selection process in fifty years, the Army now uses a Commander Assessment Program to select future battalion and brigade commanders, as well as command sergeants major. This intensive five-day program evaluates individuals for their temperament, cognitive fitness, physical health, and leadership skills. We are also expanding to build a system to assess and select our Army Acquisition Corps civilians at the same echelons. We are putting the right people in the right place at the right time to remain ready today.

Ready Today

The Army stands ready today to compete globally and fight and win the Nation’s wars in support of the Joint Force. This is only because we recognized six years ago that readiness had declined precipitously after three years of reduced funding and uncertain budgets. Since then, and funding from Congress, we rebuilt tactical readiness and built strategic readiness. However, readiness is fragile. We require continued support to maintain it, in order to reliably meet the needs of combatant commands without overstressing our people.

People are the Army’s most important weapon system. The Army represents 25 percent of the Defense budget, 35 percent of the active force, and 45 percent of the active and reserve forces, but meets over half of global demands. Today, the Total Army supports the Joint Force by supplying Soldiers to combatant commanders in more than 140 countries. Over 69,000 Soldiers are in the Indo-Pacific, including over 25,000 forward deployed on the Korean peninsula. Over 30,000 Soldiers are in Europe supporting NATO and the European Deterrence Initiative, including the forward command post of our newly reactivated V Corps. We remain dedicated to our counterterrorism and train, advise, assist missions, providing over 21,000 Soldiers in support of the U.S. Central Command theater. In our Nation’s Capital this year, over 26,000 National Guard Soldiers mobilized from 28 states to assist with medical evacuation, communications, security, logistics and safety support. Last year, we executed 64 brigade-equivalent deployments and moved 45 thousand pieces of equipment through 55 ports of embarkation/debarkation in support of worldwide missions.

This past year highlighted the need for the Army to defend the Nation at home as well as abroad. In response, the Army continually demonstrated its capability and capacity to provide timely and effective support in crisis. The COVID-19 pandemic expanded the Army’s existing mission set as DoD’s leader in protecting the warfighter from biological threats and investigating infectious diseases that threat-

en public health. Since last March, Army scientists, medical professionals, engineers, and logisticians from all components have deployed nationwide to aid COVID prevention and response efforts. For its vaccine development and distribution initiative, America turned to an Army logistician to lead operations. Our National Guard and Reserve units across America supported both neighbor and nation in an unprecedented level of mobilization, not only for COVID support, but in response to civil unrest, hurricanes, and wildfires, all while continuing to train for wartime missions.

In 2020, the Army demonstrated strategic readiness through its series of DEFENDER exercises, despite the constraints of a pandemic environment. Strategic readiness involves installation capabilities to mobilize, train, and deploy formations and then sustain them from the homeland. DEFENDER-Pacific 2020 witnessed the deployment of combat credible forces across the breadth of the Indo-Pacific theater from Guam and Palau to the Aleutian Island chain and mainland Alaska. Under the command and control of U.S. Army Pacific, combined joint forces executed strategic readiness operations that included cargo delivery, forcible entry operations, rapid infiltration of High Mobility Artillery Rocket System (HIMARS), operational maneuver of Army watercraft, and fighter combat patrols. DEFENDER-Europe 2021 is currently underway with over 30,000 multinational forces from 27 nations conducting nearly simultaneous operations across 30 training areas. This year's exercise will incorporate Security Force Assistance Brigades, the Army's new V Corps, and U.S. Air Force and Navy assets. DEFENDER-Europe 21 is led by the Army's newly consolidated U.S. Army Europe and Africa Command.

The foundation of Army readiness is our people. The Army is moving to a foundational readiness model that prioritizes the training of individuals and small units at the company level and below. The best combat units in the world ensure their individuals and small units are masters of their craft. To foster individual readiness, the Army is also investing in holistic health and fitness. We continue to study the impact of the Army Combat Fitness Test in accordance with Congressional guidance in order to better connect individual fitness with combat readiness. A solid foundation of readiness enables unit agility and provides the greatest return on an investment of limited time and resources. We will continue to use the combat training centers to bring these highly trained, disciplined, and fit teams together for large-scale collective training that validates the combat effectiveness of our battalions and brigades.

The Army must balance the continuous demand for current readiness from combatant command requirements with the imperative to secure future readiness, all without overly stressing our people or our equipment. To this end, the Army developed, tested, and rehearsed a new unit lifecycle model that will go into effect October 2021: the Regionally Aligned Readiness and Modernization Model (ReARMM). ReARMM will harmonize historically conflicting Army priorities. It will take care of people by reducing operational tempo and maximizing predictability and stability to commanders, Soldiers, and families. ReARMM will sustain readiness by carving out dedicated windows for building readiness at echelon while aligning units with primary regions and functions.

Regional alignment provides units deep wells of knowledge on the terrain, culture, and people where their units are most likely to operate. Joint force commanders also gain by leveraging habitual, trusted relationships between Army formations and Allies and partners. Finally, ReARMM will facilitate modernization by giving units dedicated windows to integrate new equipment, reorganize formations, and train on new doctrine. Adopting this model transitions the Army from small, incremental, evolutionary modernization of platforms to large-step modernization of our formations.

Army Modernization—Transforming for Tomorrow

The Army faces an inflection point that requires innovation, creativity, and entrepreneurship in the application of combat power. The battlefield is increasingly faster, more lethal, and more distributed. Overmatch will belong to the side that can make better decisions faster. To meet emerging challenges, the Army is transforming to provide the Joint Force with the speed, range, and convergence of cutting edge technologies that will generate the decision dominance and overmatch required to win the next fight. We are leading the way in developing and fielding advanced technology in support of the Joint Force.

The Army's materiel modernization transformation—what we fight with—is based on the six modernization priorities announced in 2018: Long Range Precision Fires, Next Generation Combat Vehicle, Future Vertical Lift, the Army Network, Air and Missile Defense, and Soldier Lethality. The Army's conceptual transformation—how we fight—begins with our Multi-Domain Operations concept, which we are currently turning into doctrine. The Army is using Project Convergence, our campaign of

learning and annual capstone event, to shape future concepts and capabilities. By 2035, the Army will realize its vision of a multi-domain force.

The Army is committed to seeing our signature materiel modernization efforts through to completion. Many are coming on line according to, or ahead of, our accelerated development schedule and being delivered to our Soldiers. Through continuous reform efforts, we have been able to redirect scarce resources to these key modernization efforts; however, we could not achieve this without Congressional support and authorities. Army Futures Command is providing unprecedented unity of effort across the modernization enterprise, having changed our business model and culture through public-private partnerships and a focus on Soldier-centered design. This allows us to gain immediate operator feedback, accelerating the development process and ensuring new systems are effective in operational environments. These reforms, combined with early experimentation through Project Convergence, are paying significant dividends. Judicious use of Middle Tier Acquisition and Other Transaction Authorities enable progress from characteristics to fielded capabilities in as short as three years, versus the five to seven years it took just to prescribe requirements in the past.

Long Range Precision Fires

Long range precision fires provide the capability to penetrate Anti-Access/Area Denial (A2/AD) environments, suppress air defenses and strike maritime targets at range from land, and establish our own A2/AD capability to open windows of opportunity for the Joint Force to exploit. In 2019, OSD directed the Army to develop a ground based long-range hypersonic weapon. In FY23, the Army will field the first Long Range Hypersonic Weapon (LRHW) firing battery. The Army is also developing a ground-launched, Mid-Range Capability that will complement the LRHW and the Precision Strike Missile (PrSM) capabilities. The PrSM is on schedule to conduct its maximum range test in 3QFY21 and deliver 30 missiles in FY23. It will provide greater range, lethality, and survivability at a lower cost per shot than ATACMS. The Extended Range Cannon Artillery remains on schedule for delivery in FY23. It will establish overmatch against peer adversaries in the close and deep operational maneuver areas with an extended range out to 70km.

Next Generation Combat Vehicle

Next generation combat vehicles will increase the firepower, speed, and survivability of land forces, allowing them to maneuver into positions of advantage in the future operational environment. After rebaselining the Optionally Manned Fighting Vehicle (OMFV) program last year, the Army issued the final request for proposal for the concept design phase on December 18, 2020. OMFV is an example of how our new acquisitions process enabled the Army to learn early and recover before programs become too big to fail. The Robotic Combat Vehicle (RCV) effort envisions an unmanned platform that provides decisive mobility, lethality, survivability, and increased situational awareness to formations. RCV will undergo increasingly rigorous experiments and capability demonstrations with a decision to procure by FY24. The Armored Multi-Purpose Vehicle (AMPV) is an adaptable and more survivable multi-variant vehicle that replaces the 1960s era M113 Family of Vehicles. Mobile Protected Firepower (MPF) is an armored combat vehicle that will provide, large caliber, long-range direct fires in support of Infantry Brigade Combat Teams. The first unit equipped with MPF will be in FY25.

Future Vertical Lift

Future Vertical Lift platforms and technologies increase the maneuverability, range, endurance, lethality, and survivability of Army aircraft, providing joint commanders with increased operational reach and effectiveness against near-peer competitors. Our new acquisitions process has put the onus on industry to innovate and invest early, allowing the Army to “fly before we buy.” The Future Armed Reconnaissance Aircraft (FARA) closes the gap left by retirement of the Vietnam-era Kiowa. Two prototypes will fly in FY23 followed by a year-long flight demonstration. The Future Long Range Assault Aircraft (FLRAA) will replace the UH60 Blackhawk with increased speed, range, payload, and endurance. We expect initial FLRAA prototypes in FY25. Future vertical lift will leverage advances in Unmanned Aircraft System (UAS) technology to develop Air Launched Effects (ALE) with a wide array of payloads and extended communication mesh networks with a fielding plan in FY24.

Army Network

The Army network modernization underpins Project Convergence as the Army’s contribution to Combined Joint All-Domain Command and Control. It provides necessary information technology (IT) infrastructure to link the right sensors to the

right shooters through the appropriate command and control node. In FY21, we will field more than 150 units with new technologies while simultaneously developing the next capability set of equipment. The Army is also modernizing current Global Position System (GPS) receivers to meet current and emerging threats by providing the Joint Force with advanced assured precision, navigation and timing (APNT) systems. Included are modernized receivers that meet congressional mandates to transition to M-code GPS and integrate alternative APNT technologies for our ground combat platforms, dismounted Soldiers, precision weapons and munitions, and aviation systems. We are fielding the first generation mounted APNT systems to our forward deployed formations with a second generation ready not later than FY23. Additionally, the Army continues to invest in space-based technologies that close operational gaps in deep sensing and targeting activities. We are coordinating with partners in the Intelligence Community and private industry to enhance Army access to Low Earth Orbit (LEO) space-based sensing and link with national-level capabilities to provide tactical-level sensor to shooter capability to combat formations.

Air and Missile Defense

Air and missile defense capabilities defend the Joint Force, allies, and partners against manned and unmanned air and missile threats. The Army's integrated air and missile defense capabilities will protect joint forces from adversary aircraft, missiles, and drones to protect the force and enable operations. This includes both theater systems and tactical/short-range air defense like the Maneuver-Short Range Air Defense (M-SHORAD) which defeats aerial threats to the maneuver force with a mix of kinetic capabilities. The Rapid Capabilities and Critical Technologies Office (RCCTO) is developing a Directed Energy (DE) M-SHORAD variant that utilizes a 50kW class laser. We will field four DE prototypes for experimentation and further development. Indirect Fire Protection Capability (IFPC) will defend fixed and semi-fixed assets primarily against cruise missiles and Unmanned Aircraft Systems as well as fixed and rotary wing aircraft. Based on the authorization in the 2021 NDAA, the Army is currently preparing two Iron Dome batteries for operational deployment at the end of FY22. This spring the Army will conduct a shoot-off to inform our decision on the enduring IFPC solution. RCCTO is also working on two IFPC variants, a High Energy Laser (HEL) and a High-Powered Microwave (HPM). The IFPC-HEL uses a 300kW-class HEL to defeat Rocket, Artillery, and Mortar (RAM) threats and is on track for demonstration. The IFPC-High-Powered Microwave is being developed with the Air Force to produce the Tactical High Power Microwave Operational Responder (THOR) in FY21 with a prototype expected in FY24. The Integrated Air and Missile Defense Battle Command System (IBCS) initial operational capability is 3QFY22 with fielding. IBCS is a revolutionary command-and-control system that streamlines sensor to shooter linkages for air and missile defense engagements—and once fielded will enable optimized employment of the Patriot force. This enhanced tracking system delivers an unambiguous view of the operating environment, allowing commanders and air defenders to make critical decisions within seconds. The Lower-Tier Air and Missile Defense Sensor (LTAMDS) will deliver the next generation sensor that leverages the capabilities of the Patriot Missile Segment Enhanced (MSE) interceptor and is fully integrated into IBCS.

Soldier Lethality

Soldier Lethality improvements to weapons, sensors, body armor, and training will deliver decision dominance and overmatch at the level where it matters most, allowing individual Soldiers to quickly understand and react to emerging situations. With ReARMM, we are incorporating Guard and Reserve units into the fielding schedule much earlier and more broadly than in past modernization efforts. The Army seeks continued Congressional support for the rapid prototyping, development, and procurement of the Next Generation Squad Weapon (NGSW) Rifle and Automatic Rifle, Enhanced Night Vision Goggles (ENVG), Integrated Visual Augmentation System (IVAS)—Heads-Up Display (HUD) 3.0, and the Synthetic Training Environment (STE). By 1QFY22, we'll equip the first unit with IVAS. In 4QFY22, we will equip the first unit with the Next Gen Squad Weapon Rifle and Automatic Rifle, as well as General Purpose Ammo. STE efforts that complement IVAS include the Squad Immersive Virtual Trainer (as part of IVAS) and the STE Information System that includes: One World Terrain, Training Simulation Software, and Training Management Tools.

In addition to our six priorities, the Army understands the need for considerable investment in long-term research to deliver science and technology solutions. The Army is aligning its laboratories towards modernization and partnering with over 250 research institutions. The Army's priority research areas are: disruptive

energetics, Radio Frequency (RF) electronic materials, quantum research, hypersonic flight, artificial intelligence, autonomy, synthetic biology, material by design, and advanced manufacturing.

The Army is also investing in deep sensing and analysis to provide intelligence support to long range precision fires and commanders' situational awareness during Joint All-Domain Operations. We will continue to drive intelligence modernization by acquiring capabilities and capacities across the Space, Aerial, Terrestrial, and Foundation Layers nested with and in support of the Army's six modernization priorities. We will continue to leverage the Intelligence Community (IC), other Services', and commercial partner enterprise-level Intelligence, Surveillance, and Reconnaissance collection programs to provide timely, accurate, and relevant intelligence to support Army targeting efforts and enhance commanders' decision making.

The Army is not just modernizing concepts and materiel. We require continued budget support to modernize infrastructure and execute workload in our Organic Industrial Base (OIB) of depots, arsenals, and ammunition plants, along with our power projection and Mobilization Force Generation Installations to better project power from and into contested environments. We must be able to address the risk of new and emerging cyber, information, and physical threats that can thwart our ability to project power by disrupting installation operational capabilities and the supply chains supporting our forces, whether from malign actors or nature. Our installations must be resilient to disruption and modernized in support of the modernized Army force. The Army is investing significant time and resources to mitigate the effects of climate change on our installations. We are establishing energy and water resilience, efficiency, and affordability across our installation enterprise. In the past five years, energy programs, partnerships and initiatives recognized a cost avoidance or savings of more than 14 percent, every installation has added a full-time energy manager position, and 16 of 26 Army OIB depots, arsenals and ammunition plants have transitioned from fossil fuels to clean energy alternatives. We are also partnering with private industry to implement energy and utility savings contracts that maximize the latest technology to drive efficiency and reduced costs, with 99 agreements currently in execution.

The Army is also not modernizing in a vacuum, but in partnership with our sister Services. We have completed two Army-Air Force Warfighter Talks and one Army-Air Force-Navy joint session to ensure the Army's Project Convergence initiatives remains synchronized with the Air Force's Advanced Battle Management System and the Navy's Project Overmatch to meet the unique needs of each Service. As we work to stand-up a Multi-Domain Task Force (MDTF) in Europe later this year, our Indo-Pacific aligned MDTF continues to synchronize effects with the Joint Force during multiple exercises. The MDTF's All-Domain Operations Center enables Joint training, to include hosting Carrier Strike Group-3 for the Navy's Fleet Synthetic Training—Joint exercise and connecting to the Navy's Continuous Training Environment network. During INDOPACOM's Pacific Fury 21, the MDTF validated its ability to virtually synchronize long range fires and effects with the Joint Force. The MDTF will participate in USINDOPACOM's upcoming Northern Edge and Joint All Domain Command and Control (JADC2) Simulation Experiment (SIMEX) in May before rotating into the Indo-Pacific later this summer to participate in joint exercises with PACAF, PACFLT, and MARFORPAC.

Strengthening Alliances and Partnerships

America does not fight alone. Alliances and partnerships are among the greatest sources of our military strength. This global landpower network is DoD's foundation for competition, creating inroads and maneuver space for Joint and whole-of-government strategic engagement. As a people organization, the Army is uniquely qualified to maintain and expand this vital network, especially given that partner militaries and their senior leaders are predominately land force-centric. Our roadmap for building and strengthening relationships spans a range of activities that include military and key leader engagements, education and training programs such as the Department of State's International Military Education and Training (IMET) and International Professional Military Education (IPME), security assistance through Title 22 Foreign Military Sales, and advise and assist capabilities. Boots on the ground deter would-be adversaries, and small, scalable engagements with our Allies and partners open doors to the access and presence we need to compete effectively. The Army's new Security Force Assistance Brigades (SFAB) demonstrate our commitment to alliances and partnerships and our capability to compete.

Last year we completed the activation of all six SFABs, five in the Regular Army and one in the Army National Guard. Since then, 5th SFAB has already completed missions with multiple partners across the Indo-Pacific theater, including elements of the Thai, Indonesian, and Indian armies. Later this year, many of those partners

will join their American counterparts in combined exercises at the National Training Center. Engagements such as these are vital, not only for interoperability, but in recognition that Cold War-era exclusive allegiance to a single great power no longer exists. Many if not all of our allies and partners maintain concurrent relationships with both the United States and our competitors and potential adversaries. We cannot take for granted these relationships and the vital access and presence they provide us.

CLOSING

The men and women of the United States Army are the greatest Soldiers in the world. The Army is cultivating cohesive teams, maximizing talent, sustaining tactical and strategic readiness, progressing through our greatest transformation in over 40 years, and strengthening our alliances and partnerships. We are leading the way in developing and fielding high technology for the Joint Force. We are opening operational and strategic doors in the Indo-Pacific and Europe. We are succeeding through calibrating our force posture around the globe to assure our partners and deter would-be adversaries. And we need your continued support. With timely, adequate, predictable, and sustained funding, we will remain ready to fight and win our Nation's wars—now and into the future.

Senator TESTER. Thank you, General. Appreciate the comments of you and the Secretary. First off, I want to thank the Army, especially the soldiers of the National Guard, for their efforts in supporting the capital security mission over the last several months. While there has been discussion on a much needed supplemental appropriations bill to cover these costs, I am getting nervous about what will happen if those funds are not approved and approved soon.

So, Secretary Wormuth, can you give us some insight on how much the Army is insured across its components from that mission? What sort of tradeoffs you are going to have to make as you push funds around to cover those costs in the short term?

Secretary WORMUTH. Yes, Chairman Tester. Right now, the resources basically to pay for the support that the National Guard has provided to the Capitol, and I want to take a minute also to just recognize their enormous contribution, is about \$450 million. So that is the bill associated with the support that they provided in this execution year.

If we are not able to cover that, right now the Army Guard is basically in a situation where they are concerned about their ability to pay for training for the rest of this year. So without that, those resources, the Guard, for example, and you know, and this is in States all around the country, will find themselves with training issues that are going to affect, you know, both their aviation readiness, for example, their ability to have readiness with their ground vehicles, they are going to have, you know, again, many of the training exercises that they have put off because of everything else they have been doing in support of COVID, in support of the Southwest border, in support of being here in the capital.

All of that regularly scheduled training has been postponed and now is at risk of not being able to be funded. And so it is definitely a concern and something that will impact our Guard all around the Nation.

Senator TESTER. So has training been postponed already?

Secretary WORMUTH. Senator, no. My sense of the situation is at this point, they have been—they are in a position where they don't want to with—spend funds for the remainder of the year because then they will be basically at a point of being in violation of the

Anti-deficiency Act. So it is really looking at the summer months, July, August, September.

Senator TESTER. That is when it will kick in?

Secretary WORMUTH. Yes.

Senator TESTER. That is good to know. General McConville, one proposal that is being floated openly is the idea of a standing military quick reaction force for capital security. How do you feel about this mission, and do you think it is appropriate for the Army?

General MCCONVILLE. Well, my best military advice, Senator, is law enforcement should be conducted by law enforcement agencies and the military should be the last resort when it comes to law enforcement.

Senator TESTER. I appreciate your direct answer to that. Thank you very, very much. Shifting to the Pacific, where we are driving a lot of modernization priorities to fight China. The Army's going to need helicopters with increased range and speed and missiles, very long ranges. This year's budget request includes an increase in investments in the Army's modernization priorities from \$9.5 billion to \$11.3 billion. General McConville, can you give a quick overview of your increased investments in fiscal year 2022 and how they support the shift to the Pacific?

General MCCONVILLE. Yes, Senator. We have about \$1.9 billion focused on the Pacific. That does not include the pay for the 69,000 soldiers that operate the Pacific. The key to what we are providing the combatant commanders out there is we provide the new organization Security Force Assistance Brigades, which allows them to work closely with our allies and partners in the region and build up their capacity. We are developing a multi-domain task force that provides really two capabilities, long range precision effects, which is very, very important in the competition, because they can do intelligence, they can do information operations, they can do cyber electronic warfare, and space operations.

They also have the capability which we are developing, it is long range precision fires, which helps with deterrence because it gives us the ability to potentially penetrate any type of anti-access area denial capability that is set up by potential competitors in the region. We are also doing multiple exercises, so we have a chance to work with our allies and partners, and we are present throughout the region, which is very, very important to reassuring our fellow land components that will be there when they need us.

Senator TESTER. Thank you, General. Senator Shelby.

Senator SHELBY. Thank you, Mr. Chairman. The Army's fiscal year 2022 budget request for research and development continues to focus on six modernization priorities, yet the 2022 budget proposal for research and development funding is \$1.3 billion less than last year. Madam Secretary, now that you have taken the helm and begun to review these modernization efforts, are you considering any changes to the focus areas or the approach that the Army has taken to its modernization priorities?

Secretary WORMUTH. Vice Chairman, Generally, I am very comfortable with the modernization priorities that the Army has at this time. And as General McConville was just speaking to, I think the kinds of capabilities we are looking at in terms of long range precision fires, future vertical lift, you know, next generation vehi-

cles, and air and missile defenses also are all very appropriate to the kinds of near peer challenges that we are facing. So broadly speaking, I am comfortable with where we are heading.

I think, you know, we are going to have to continue carefully balancing between our modernization emphasis while also maintaining our readiness and taking care of our people. But I think we are going in the right direction on modernization, sir.

Senator SHELBY. Would you deem research and development a very high priority, period?

Secretary WORMUTH. Yes, it is very important that we continue to emphasize development.

Senator SHELBY. For tomorrow's weapons—

Secretary WORMUTH. Yes, exactly. And we have got about 74 percent of our R&D account focused on our 31 plus 4 priorities for modernization.

Senator SHELBY. General McConville, could you provide a General overview, knowing we are not in closed session, on the progress of the Army's six modernization priorities and outline what risk that the Army is accepting by reducing its research and development funding as it pursues those priorities? It is a dangerous road, you know.

General MCCONVILLE. Yes. Well, as the Secretary said, we have done some tremendous work, we call it night court, to take a look at our modernization priorities and make sure that we align the resources with them and the research development. So we have moved a tremendous amount of money, about 74 percent of our research and development funds focused on those modernization priorities. They are moving along very, very well. As you know, Senator, hypersonics is moving extremely quickly. We expect our first battery and in 2023, our mid-range capabilities, moving along very capability, we expect to be able to send ships in 2023.

Our present strike missile capabilities is moving along very capable. We expect to have the first battery around 2023. Our next generation combat vehicle is moving out. That is going to come in about 2028. And future vertical lift, we have two different aircraft that we are developing, both are flying models right now. Again, this is exceptionally fast, delivering that to the troops. We want to fly before we buy and that is coming in around 2028. We are making great strides in air and missile defense so we can counter unmanned aerial systems. We are making great strides in convergence with our network and bringing together our sensors and shooters, so we have the overmatch we need.

And finally, for our soldiers, we are getting them the lethality they need through an integrated visual augmentation system, a new carbine that can be much more lethal on the battlefield, and a new squad automatic weapon system. So we are very, very pleased with the progress that we are making on the six modernization priorities and really very pleased the way we are working with industry in a different way.

Senator SHELBY. Sir, the Army's Rapid Capabilities and Critical Technologies Office is leading the development of the long range hypersonic weapons. This program is scheduled to conduct several test events in 2022. What do you expect to learn, that you talk about in this session today, to the test of the schedule next year,

and how will this data from test events lead to decisions for the program? And how is development going on the thermal protection system, which I think is very important there?

General McCONVILLE. Well, Senator, as you know, we had a very successful test last year. We are getting ready to do another test over the upcoming months. That test is, again, is going to confirm a lot of the systems. It is going to make sure that the range—that, you know, we are going to get a much better idea of what type of range the system can work. We know the precision is there. So what we are going to take away from the testing is more assurity when it comes to what is the range, you know, the max range, the system, what is the precision of the system, and so far, we are very pleased with the progress.

Senator SHELBY. General, how is the development going on in the sensor integration display for the heads up display component of the system?

General McCONVILLE. Well, the heads up display for—I want to make sure—

Senator SHELBY. The integrated visual augmentation—

General McCONVILLE. Well the integrated visual augmentation system is transformational. It is coming along very, very well. It is probably one of the most transformational systems that we have in that we are able to fuse night vision capability with an infrared capability. But more importantly, it provides situational awareness to our soldiers that we have never had before. And the future will be that soldiers will be able to fight with this system, they will be able to rehearse with this system. They will actually be able to train with this system in virtual reality.

Senator SHELBY. Madam Secretary, quickly, in the area of production, some of us are concerned that some of the proposed delays in building things with our industrial base, you know, this could be a problem. What is the Army doing to ensure that the industrial base will remain viable for these programs if you slow-walk some of them?

Secretary WORMUTH. Well, Senator, very quickly, I would say I think the primary thing we are doing is having Army Materiel Command undertake a 15 year plan to essentially try to align our future requirements and make sure that our organic industrial base and the commercial industrial base can meet those needs over time. That is the primary—

Senator SHELBY. Keeping that industrial base together is very critical, is it not?

Secretary WORMUTH. Absolutely. We have to be able to have that industrial base to make all of the new next generation systems that the Chief was mentioning. And as you know, ensuring, frankly, the cybersecurity of our suppliers and our industrial base is also a key issue that we have to get after.

Senator SHELBY. Part of it. Thank you. Thank you, Mr. Chairman.

Senator TESTER. Thank you, Senator Shelby. Senator Leahy.

Senator LEAHY. Thank you very much. And thank you for having the hearing. And thank you both for appearing. General McConville, You may find it unusual that in an Appropriations committee meeting there may be questions that sounds parochial,

but I think this has a broader meaning. The Vermont National Guard's Mt. Calvary Battalion opened every position to women, it can recruit women directly to any position. I believe it is the first Army National Guard Cavalry Unit at that level in the Nation do so.

I visited Bravo Troop from that battalion. They were here at the U.S. Capitol following the January 6th insurrection. And now they are deployed overseas. It is a remarkable feat I think. Anyway, I am very impressed by it. The challenging nature reminds me why many of us supported the removal of barriers to women serving as well as all sorts of soldiers of different walks of life. I have always felt the Army is strongest when it finds the best soldier for the job, not the soldier who meets certain preconceived notions.

So how does the Department's budget request support the recruitment and retention of soldiers from diverse backgrounds to a unit like Vermont's Mt. Calvary?

General MCCONVILLE. Yes, sir, I think the point is well taken. You know, we are in a competition—in fact, we are in a war for talent in the United States. We want the best and brightest to come into the military. We want the military to represent the diversity of the Nation. And we are doing that by having the right leadership with the right background. So if you want to take a look and see who is commanding, recruiting command is a person of diversity so people can look up to see people like them.

Our recruiters come with diversity so someone can talk to them if they want to be in the infantry, if they want to be in the armor. And from where we sit is we want everyone to have an opportunity, and we are appealing to them, and we are giving opportunities at every level so people can look up and see people who look like them. And that is how we keep the diversity in the Army.

Senator LEAHY. I appreciate that. I look at a place like New England where it is getting harder and harder to recruit. I would urge you to empower local recruiters and Adjutants General as much as you can. Madam Secretary, the U.S. military has long been at the forefront of energy revolutions. We all know making energy cheaper and less supply line intensive makes a military force more capable.

The President has been investing in clean energy and energy efficient technology a priority for every part of the U.S. Government. This Committee has even supported research with the Army Corps on energy efficiency technology over the years because it would free up money for other things. How does your request support development of clean energy and energy efficient technology?

Secretary WORMUTH. Thank you, Senator. Within our budget, we are trying to do a few different things to try to help us advance clean energy, and particularly in terms of our vehicle fleets. You know, we are exploring where we can look at hybrid vehicles potentially, how we can increase electrification in our vehicle fleet. We are looking at trying to use battery powered where we can. So there are a variety of efforts that we are trying to look at across all of our different types of vehicles to work with clean energy.

We are also, you know, again, looking at other ways that our installations can be more energy efficient. We are doing quite a bit to look at where we can use solar power, for example, or wind

power at our installations. I was just at Fort Hood and saw the solar panel fields there, for example. So we have a number of different places where we are trying to advance and go more towards clean energy.

Senator LEAHY. And the solar panel field, you wouldn't have seen a few years ago?

Secretary WORMUTH. That is probably true. I actually grew up in Texas and I don't recall seeing solar panels there.

Senator LEAHY. Thank you. Mr. Chairman, I have a question which I will submit for the record for the General. It is about—it is a little bit involved on construction issues, but I really do want an answer. And I know you will supply one.

General MCCONVILLE. Yes, Senator, I sure will.

Senator LEAHY. Thank you.

Senator TESTER. Thank you, Senator Leahy. Senator Moran.

Senator MORAN. Chairman, thank you. Madam Secretary, General McConville, welcome. Congratulations on your new position as Secretary, and for your long distinguished service, General McConville. I am going to visit Germany and Poland in the near future, and I will see transnational training exercises focused on Russian deterrence. We face lots of challenges around the globe. Our focus is sometimes shifted by necessity and by changing circumstances. What should be my take away? What do you hope I see and come back confirmed of the importance of what we are doing?

Secretary WORMUTH. I want to make sure my mic is on. Well, Senator, I think what I would hope that you would see is, is a couple of things. First of all, I hope you will see the close partnerships we have with our land forces in Europe. And obviously, you know, NATO (North Atlantic Treaty Organization) is our center of gravity there. You know, our enhanced forward battalions with NATO are very important. And from an Army perspective, I hope you will see the value added that the forward element of the 5th Corps that we have now put in Poland, what that is doing to again bring our partners together and present a strong deterrent to the Russians. That is what I would ask that you look. Chief may have additional—

General MCCONVILLE. I agree with the Secretary. I hope you see peace through strength, and that strength comes from a strong military, a strong Army, and strong allies and partners. And I was just over there last week. We hosted a conference for European armies, had 32 Chiefs of Staffs from all the countries coming together. They want American leadership. They want to be good allies and partners with us. They want to have a strong friendship.

And I think the way we deter others who wish us harm is by having all that come together. And in the training is important. Just like any professional team, you have got to train, you have got to rehearse, you have got to prepare, and that is where that strength comes from.

Senator MORAN. Thank you both. General McConville, given the rapid modernization of Russia and China's armed forces, I have some concern that the Army's budget dropped significantly below what is necessary to modernize a full brigade of Abrams tanks each year. If Congress provides additional funding for Abrams produc-

tion, can you assure us that you will keep the Abrams production, at least at the level of one brigade a year?

General McCONVILLE. What I can assure, Senator, is on my unfunded requirement list. And if we do receive additional money, we will prioritize that and go after those unfunded requirements.

Senator MORAN. What is our capabilities of ascertaining or making certain that the active and guard units that are scheduled to upgrade those tanks receive them on time?

General McCONVILLE. Well, that is why we want—you know, that is why it is part of my unfunded requirement is to make sure—you know, we have had to make some tough decisions in the Army based on priorities. And we are—when I look at the Abrams tank that is not legacy to me. I see that as an enduring requirement. We also have modernization requirements which are the six modernization priorities. But the Abrams tank is going to be here for a while. And we have incrementally improved it and we need it for the future. But we also need to modernize the Army. And we are going to have to make the, you know, tough decisions based on the resources we get. And we will do that on the priorities.

Senator MORAN. Secretary, digital design and engineering has become an important resource for weapon system development and sustainment. It has already proven its ability to increase sustainment efforts on legacy platforms and I think we will play a major role in the design of future defense programs. Can you discuss the importance of making these digital designs more accessible to service members to give them the tools to increase readiness on legacy combat vehicles? And how does the Department plan to invest in this new technology as we develop this next generation of warfighting platforms?

Secretary WORMUTH. Senator, what I would say is certainly incorporating digital designs into our prototyping and modernization process is very, very important. And frankly, we are trying to bring in as many different types of new techniques to help us be more innovative as possible. So, for example, I think that we are using digital design as we look at the new optionally manned fighting vehicle, for example. And there are undoubtedly other programs within our 31 plus 4 where we are making use of that. I have not been able to dive in-depth into how we are using digital design, but again, I know we are trying to be much more innovative.

We are collaborating with various universities, for example, with companies, you know, smaller startup companies in Austin, for example, where we have Austin—or where we have Futures Command. So we are very much trying to bring things like digital design into our process.

Senator MORAN. I hope to have you as a guest in Kansas where we can demonstrate that technology.

Secretary WORMUTH. I would welcome that.

Senator MORAN. Thank you, ma'am.

Senator TESTER. Thank you, Senator Moran. I will get you as you entered the room, Senator Shaheen.

Secretary SHAHEEN. Well, thank you, Mr. Chairman, and thank you, Secretary Wormuth and General McConville, for your service. One of the new potential areas of conflict, and certainly of a lot of other activities, is the Arctic. And so it is very important that we

know as much as possible and have as much research as possible about the Arctic. One of the labs in this country that does that research is in Hanover, New Hampshire. It is the Cold Regions Research and Engineering Lab. So can you just speak to whether, I guess this is for you, Secretary Wormuth, whether you think the Army Corps of Engineers labs are uniquely situated to confront the challenges that the Army and the joint force are going to be facing in the Arctic?

Secretary WORMUTH. Senator, I think, yes, the Corps of Engineer labs are very helpful to us as we explore these new environments and what kind of requirements they are going to present to us. The Arctic is absolutely becoming an arena of competition between the Russians and the Chinese, for example. You know, Russia in particular has been enhancing its military posture in the region. China is definitely engaging in exploration more oriented towards natural resources.

And as we think—as you know, the Army has put forward an Arctic strategy. And as we think about building that out and what kind of formations and gear that we are going to need, I think we will want to leverage the Corps of Engineer labs, and again, other, you know, partnerships with universities to help us think that through.

Secretary SHAHEEN. But yet the budget request cuts the Army's research and development. So can you speak to how we are going to continue the research that we need to do if we are making those cuts?

Secretary WORMUTH. Senator, I think, you know, again, I would want to look carefully at what exactly the labs have to offer, and the resources associated with that. I was not yet in the Secretary position, as you know, when our budget was made. But we have had to make very difficult choices. Again, as we balance readiness, people, and modernization, we have had to make some difficult choices. But I would certainly look into that and be happy to talk with you.

Secretary SHAHEEN. Thank you. General McConville, do you have anything to add to that?

General MCCONVILLE. Well, I do have is, as the Secretary said, you know, we have put a new strategy for regaining dominance in the Arctic. It is a place that we really haven't taken a hard look at. You know, we have got a great State of Alaska. We have troops up there. But we see us operating more in the Arctic than we have in the past. So we are going to have to have that capability.

We are developing equipment, we are developing organizations that can do that. We are going to recruit the right people that can operate in that environment, make sure they have the right clothing, and the right capabilities. But we see that as a place in the future that we need to be. And as I said, I have met with our European allies and the Arctic States are very interested in working with us on those capabilities.

Secretary SHAHEEN. Thank you. The enhanced night vision goggles, the vernacular ENVG, is currently being fielded and it has received really positive reviews. I know about this because we make it in New Hampshire, but I understand the fiscal year 2022 request is approximately \$218 million, which is less than what we had

been projecting. So can you tell me, does the Army still plan to make those investments for the ENVG in 2023?

General McCONVILLE. Well, Senator, as you know, those—the troops really like those goggles. They are extremely good. And, you know, we are developing two systems, the enhanced night vision goggles, Bravo, which that is called, which our troops—it is great investments. We are also developing the IVAS system, which is a more sophisticated system. But that enhanced night vision goggles process is still going to be around. It is very, very good. It fuses both night vision and flare capabilities. Some incredible videos out there of the troops talking about it. So we are committed to moving forward there. Again, there are tough decisions being made on the budget and they are reflected in our budget.

Secretary SHAHEEN. I have a question which I will submit for the record on IVAS (Integrated Visual Augmented System), but on Afghanistan just briefly because I have only a little bit of time left, will there be a change in our budget requirements for Afghanistan because we are going to be leaving earlier than anticipated? I understand we expect all troops to be out by the end of July.

Secretary WORMUTH. Senator, our budget reflects, you know, the expected savings from the retrograde out of Afghanistan. I think as the Department determines exactly what the posture is going to look at in support of the over the horizon requirements, you know, we may have to look at what the resources are going to be attached to that.

Secretary SHAHEEN. And can you tell me what the savings are?

Secretary WORMUTH. I don't have that—

Secretary SHAHEEN [continuing]. don't immediately put those dollars into the over the horizon.

Secretary WORMUTH. I don't have that number off the top of my head, Senator, but I am happy to take the question for the record and get back to you.

Secretary SHAHEEN. Okay, thank you. Thank you, Mr. Chairman.

Senator TESTER. Thanks, Senator Shaheen. Senator Blunt.

Senator BLUNT. Thank you. Thank you, Chairman. Secretary Wormuth, congratulations on your nomination and confirmation as Secretary. Look forward to the work you will be doing there. Our biggest base in Missouri is Fort Leonard Wood. It is in many ways the schoolhouse for a lot of the military right now, principally Army still, but I think on any given day, there are probably more people from different services there than any base in the country. I hope you can get that on your list to visit and you will find the community incredibly supportive of the fort and what happens there. And General McConville, thank you again for your service and for being here today. With the future budget necessities, I don't think that includes, is likely to include a basic combat training reduction or not. I would like both of your thoughts on that.

And if there is a basic combat reduction there, we are talking about Fort Leonard, where the original goal at Fort Leonard Wood was basic training. We have gone way beyond that, but still an important part of what happens there. There are three other basic training facilities. If there is a reduction, I think people representing those four facilities, certainly me, would advocate that

that reduction be proportional rather than eliminating training in one base.

So one, do you think there will be a reduction? And two, do you have thoughts on what would happen in those four bases in training if there is a reduction? General.

Secretary WORMUTH. Senator, to my knowledge at this time, we are not contemplating a reduction in basic training at this time, but I think, you know, certainly if we had to do that, it would be concerning. But I think we would want to look at what makes most sense in terms of efficiency and effectiveness in terms of managing our resources.

So I would want to look at the four places where we do basic training and basically run the numbers to see where, if we had to reduce basic training, how we could do that most efficiently. It might be that doing that proportionately would be most efficient, but it might be that it made more sense to perhaps consolidate our training in, you know, some less than all four locations. So I think I would want to look at that.

Senator BLUNT. General, do you have a view of that?

General McCONVILLE. Yes, Senator. My view is, as I discussed, you know, we have got an active strength of 485,000, a little over 1 million. We think that is required. We think the training to support that is required. And so we do not anticipate, unless we have some type of resource reduction, to cut basic training. I think we need the Army we have given the situation that we see around the world.

Senator BLUNT. Well, if you do cut a location, we could discuss at that time. But clearly, if you get into an up tempo, again, having to start another location from what would have become a dramatic reduction would make a difference. And while we are on Fort Leonard Wood, we have made substantial commitments there in the last four budgets toward the Fort Leonard Wood Community Army Hospital. It was the number—it was number one on the Surgeon General—on the Army Surgeon General's list and the overall Force Surgeon General's list for a long time. And we are well into that process.

I think the monies being requested for fiscal year 2022 to finish that hospital really matters to the base and really matters to the community. On the—General, as we withdraw from Afghanistan, what impact is that going to have on our rotation of forces which have been Afghanistan, Korea, Europe and elsewhere? Still thinking rotating—is the best way to handle that?

General McCONVILLE. I think, Senator, you know, what is being done is really a global posture review. We will take a look at what type of forces we need. There is some value in having rotational forces. There is value in having permanent forces. There is value in having what we call prepositioned stocks, so the troops rotate in and fall on those equipment. And we are in the process of—the Administration is having that discussion. And what we will do is lay out those options based on what it looks like. And so when you look at Afghanistan, there is discussions of what is over the horizon, you know, what does the future look like in the Middle East.

So that has to be looked at. The Administration is taking a look at what does the Indo-Pacific look like and then certainly what Eu-

rope looks like. All those will come into discussion, and we will provide the appropriate best military advice on how to accomplish that mission. But I do see some rotational forces. I don't see all rotational forces.

Senator BLUNT. Alright. At least one of the questions I will ask for the record would be as we pull the contingency overseas account into the regular budget, what impact that has on our flexibility when we have something we don't anticipate? And I am out of time, so I will ask that for the record and look forward to your response on that. Thank you, Chairman.

Senator TESTER. Thank you, Senator Blunt. Senator Baldwin.

Secretary BALDWIN. Thank you, Mr. Chairman. The upcoming JLTV (Joint Light Tactical Vehicle) recompetes provides an opportunity to seek upgrades and to improve the vehicle's capabilities. I am particularly interested in efforts to transition the JLTV to electric power trains, considering the advantages it would provide in future environments and because it would support the President's interests in promoting green energy. I know you just had a little discussion about electrification within the Army. Why is that JLTV program not pursuing a more aggressive transition to electrification? And is this something that you are considering for the recompetes?

Secretary WORMUTH. Senator Baldwin, again, I have not had the opportunity to dive deeply into some of these programs. I know that the follow on production for the JLTV is on track and we are looking at, you know, how to move forward with that particular contract. I would ask General McConville to try to speak to your question of how the Army has been thinking about it in terms of electrification efforts.

Secretary BALDWIN. Please.

General MCCONVILLE. I think the Senators, what we are seeing—you know, we have efforts going for electrification. We have got a reconnaissance vehicle that we are actually trying to make fully electric. These tend to be smaller vehicles rather than larger vehicles. So, you know, and there is value in that. And first of all, reduces our ability to divide fuel, which we like to do. That keeps, you know, trucks off the road in those type things. But they are also very, very quiet, which is helpful when you are maneuvering on the battlefield.

Some of the bigger vehicles in the joint light tactical vehicle—first of all, that is a great vehicle. It is very good for the troops. Is we are looking at probably a hybrid, you know, how do you reduce fuel in a hybrid? You know, and we are looking at bigger vehicles too. You go to hybrid first. We are concerned and we have people looking at electrification, but on the larger combat vehicles, what can you do in the near term? What can you do in the long term?

And in some cases, we are not sure we can get to fully electrification, but can we get to a hybrid that cuts fuel by 25 percent? Can we reduce how they operate at idle, which, you know, saves fuel? And so we have folks taking a look at that. But as far as going to a full electrification of that vehicle, I don't think we are there yet.

Secretary BALDWIN. Okay. On modernization, I know the Army is divesting from legacy programs to fund other priorities, but the

JLTV certainly is not a legacy program or platform. Yet over the last 4 years, the Army has often characterized the platform as a smaller MRAP (Mine Resistant Ambush Protected) or designed for the last war. The requirements that drove the creation of the JLTV do not support this claim, and the program was never designed to be the next MRAP for Iraq and Afghanistan. To their credit, the Marines have looked to the JLTV in their shift to supporting the Navy against peer adversaries, using the JLTV as the platform to support new shore to ship and long range fire capabilities. Are you familiar with these Marine Corps initiatives, and are you exploring any similar efforts at this point in time?

General MCCONVILLE. Yes, I am aware what the Marine Corps is doing. They have got some innovative ideas with the joint light tactical vehicle. What we are looking at is how we bring it into the force. And our numbers are significantly larger than what the Marine Corps is doing with the joint light tactical vehicle. That we have goals set up there. And really what happens, that is an enduring vehicle. That is not a legacy vehicle.

I just want to make sure people—because we have kind of had it characterized there is legacy, there is enduring, and there is the modernization efforts we have. So I see you really three categories as we discussed. The joint light tactical vehicle is an enduring vehicle. It is something that we need in the future. But it all comes down to, we are trying to give you all the best Army we can give you with the resources we have.

Secretary BALDWIN. Okay, I just would point out that JLTV continues to sort of act as a bill payer for other programs in the PB (President's Budget) 2022, resulting in about \$120 million unfunded requirement for the Army. So that is of concern. Let me just add, I think I have limited time left, that Senator Shelby asked earlier about the industrial base. And I believe, Secretary, you said that there was a report in the works from Materiel Command. I would like to get briefed on that report when it is available. And so I look forward to receiving that.

Secretary WORMUTH. Yes, Senator, it is in development now and we would be happy to discuss it when it is complete.

Secretary BALDWIN. Alright, thanks.

Senator TESTER. Thank you, Senator Baldwin. Senator Boozman.

Senator BOOZMAN. Thank you, Mr. Chairman, and thank you all for being here, and we really do appreciate your service to our country in so many different ways. As ranking on MILCON (Military Construction) of the Appropriations subcommittee, I know the importance of investing in quality of life projects such as barracks and family housing, as well as the impact of increased morale among the soldiers and their families, that that generates.

The strength of the Army is people, and certainly I know that you all agree that that should be right at the top of the list regarding priorities. Madam Secretary, given a tough budget cycle this year, how do we adequately address the funding for America's family housing and other quality of life issues that are so important?

Secretary WORMUTH. Senator Boozman, you are absolutely right that housing for our soldiers and our families is very, very important. And the Army has undertaken a number of initiatives in the last few years to try to make sure that we are providing the kinds

of housing for our families and soldiers that they need. You know, we have consolidated, for example, oversight of our privatized housing with Army Materiel Command and Installations Command. In terms of barracks in particular, we have a plan to invest about \$11.5 billion over 10 years to refurbish those barracks that are not as in good condition as some of the others.

And for example, I was just at Fort Hood a week or two ago and I saw some of our newer barracks, which I thought were quite satisfactory. But some of the barracks, frankly, that need to be modernized. And we are trying to do that as quickly as we can in the context of a flattening budget.

So there have been some difficult choices. I think there are some barracks facilities, for example, on General McConville's unfunded requirements list. But we do have a plan to try to move forward as quickly as possible to make sure that our soldiers have the housing they deserve.

Senator BOOZMAN. Very good. And we appreciate the list, General. You all are not bashful at all, and hopefully we can be of help in securing some additional funds along those lines. General, over the past 4 years, the Army has worked tirelessly to restore its readiness levels, which again is so important. It is fragile, if not adequately sustained. It can decline very quickly, as we have seen at different times in the past.

You mentioned the Army is implementing a foundation readiness model that will prioritize training at the company level. I guess the question is, do we have enough training capacity and resources on the active duty installations, or do we need to perhaps augment those installations with regional maneuver training centers to meet the intent of your foundational readiness model?

General MCCONVILLE. Well, Senator, I think we have the appropriate amount of training areas available. You know, what we are finding is this is a time for soldiers to train. And what we are trying to do is we are trying to focus—you know, if you only have so much time and so much resources, where do you spend those resources? I argue that you do that when you have new troops. You have new troops coming in units.

We bring in about 125,000 soldiers every single year. They have to get the basics. They have to get the training. They live in our organizations we call squads. And so you get the squad straight, you get the platoon straight, you get the company straight, and then we can take our battalions and brigades to our national training centers and our combat training centers and making sure they get the higher level type training. But if you don't get the foundation right, it is like building a house on a poor foundation.

It may look good in the top, but it is not good in the bottom. So that is the shift we are doing right now with the time and resources we have available.

Senator BOOZMAN. So with Afghanistan coming down, will the up tempo decrease or will it be maintained or—

General MCCONVILLE. Well, the amount of troops we have in Afghanistan is pretty small. I mean, we are talking, you know, 2,500 troops at the time. That is not a tremendous amount of troops when you take a look at where we were at. So a lot of people say, hey, is that going to change a whole lot of things? Not too much

for the Army. The 2,500, you know, brigade plus, you know, brigade minus is not a huge amount of troops.

Senator BOOZMAN. Very good. Thank you, Mr. Chairman.

Senator TESTER. Thank you, Senator Boozman. Senator Hoeven.

Senator HOEVEN. Thank you, Mr. Chairman. General, the Army National Guard is expected to deploy and fight alongside the active duty counterparts. Army currently trains on the MQ-1C Gray Eagle out of Fort Huachuca in Arizona. And I understand there you are having trouble getting enough training for the active duty members, just the volume. And so my understanding is, it is also difficult to get Guardsmen through that training. So are we training enough soldiers to operate the Gray Eagle in a timely fashion? My first question.

General McCONVILLE. I think so, Senator. I am sure we could train more, but at least the amount of aircraft we have, which is the trade off, is that those are going to use them—you know, the other thing with the Gray Eagle as we look to the future is that, and we see it contested air defense environment, we are going to have to take a look at what the utilization of that aircraft is.

As we take a look at our intelligence, surveillance, and reconnaissance aircraft that we have in the Force, many were designed for what we call irregular warfare, counterterrorism, counterinsurgency, where there is not a big air defense capability. So as we look in the future, we are going to take a hard look at what type of aircraft we have doing that mission.

Senator HOEVEN. Right. But the Army National Guard doesn't have its own MQ-1C aircraft or great—what are they called, Gray Eagle, excuse me, aircraft. They don't have it.

General McCONVILLE. That is right.

Senator HOEVEN. So it seems to me you have got bit of a bottleneck in terms of just getting your active duty forces through level and training guard. Then the Guards are supposed to support that mission, which they do tremendously well, and many others, but they don't have the Gray Eagle. So both in terms of training and then actually having units that have the Gray Eagle, how do we address that? Because you get both the training issue, but you also have an equipment issue when you want the Guard supporting your active duty forces and you have to have that equipment to train on.

General McCONVILLE. Well, that is what we are taking a look at, Senator, and we can take that for the record and come back to you, because I think—I saw, you know, as I look at where we are going in the future, we have got to come up with a—as the strategy has changed, we need to come up with the way we are going to do that.

Senator HOEVEN. Right. But you got that equipment across all your battle groups, active duty, but nothing in the Guard have you got training. So it is something we do need to help you address.

General McCONVILLE. Yes, we will take a look at it.

Senator HOEVEN. Thank you, General. Appreciate that. Madam Secretary, so obviously unmanned is a big issue, and then also countering unmanned aircraft, and then various forces deal with it, you know, in different ways. Obviously in the Army sphere, you have got the small, unmanned aircraft that you have to deal with for your troops. You operate the Joint Counter Small Unmanned

Aircraft System Office, which works with DOD (Department of Defense) to counter small unmanned UAS—we have one of the UAS sites—as a matter of fact, the first one established in North Dakota, the upper plains, the test site, or Great Plains test site I should say.

We work a lot with Customs and Border Protection, too, because we have got 900 miles of border responsibility on counter UAS. So how are you working that issue? And how can we be helpful to and continue to develop this counter small UAS arms issue?

Secretary WORMUTH. Thank you, Senator. Certainly we are, you know, the entire Department of Defense is concerned about the UAS problem. All you have to do is look at and see how drones were used in Nagorno Karabakh, for example, to see the potential threat that they pose both, to our forces overseas, but potentially here at home. We are the executive agent for the joint program office that is responsible for looking at counter small UAS capabilities, and the Office of the Secretary of Defense, which we work with closely, is actually responsible for liaising, if you will, with the interagency, for example, with Department of Homeland Security and the Customs and Border Patrol.

But we are working very closely with them, as well as with the FAA (Federal Aviation Administration) to look at how best to counter those kinds of threats. And I think the Center of Excellence can be very helpful to us as we continue to work that hard problem.

Senator HOEVEN. So who would we link in with at your office or Army, who would be the right person for us to connect with to really talk about how we can do some partnering or provide some assistance in this effort?

Secretary WORMUTH. Well, you could certainly talk to us in our joint program office. And I think in terms of looking towards other partners in the Federal family, you would probably want to talk to the OSD (Office of the Secretary of Defense) Homeland Defense Office.

Senator HOEVEN. I mean, we have a ton of partners. I mean, Guard, active duty, military forces, Customs and Border Protection, the State—I mean, we have got a ton, NASA (National Aeronautics and Space Administration). So I am just trying to understand the best point person to make sure we have clicked in with you in terms of what Army's needs are.

Secretary WORMUTH. Yes, I think our joint program office is the best belly button.

Senator HOEVEN. Thank you, Secretary. Thank you, Mr. Chairman.

Senator TESTER. Thank you, Senator Hoeven. Senator Murkowski.

Senator MURKOWSKI. Thank you, Mr. Chairman. Madam Secretary, General, welcome. Thank you, Madam Secretary. I haven't had an opportunity to personally congratulate you so we did it over the phone. But nice to have you here. I appreciated the conversation that we had last week regarding the Arctic. And as Chairman, I feel like I have arrived when the Senator from New Hampshire asks the first Arctic question for the hearing. It is like, hallelujah, we are here. We have been here for a long while. And the military

has recognized that, certainly the Army has recognized that. We have had an opportunity to talk about the Arctic strategy document that has been released. This is probably for both of you with regards to where—in the strategy, we note that the current unit distribution and alignment for Arctic operations may require configuration.

The Army will evaluate and adjust its necessary tactical and operational headquarters and unit relationships to best support. So where are we in this? What specifically and when specifically can we see this evaluation moving forward, where in the organization is this review being considered, and let me know where we are with this alignment for Arctic operations?

Secretary WORMUTH. Senator Murkowski, it is nice to see you as well, and thank you for those congratulations. We are having now issued the Army Arctic strategy. We are really in the process of looking at exactly its implications in terms of what kind of units we might want to see in the Arctic, exactly what kinds of equipment they would need to carry out those roles. And I have to be briefed, frankly, in more detail myself in terms of where we are precisely in our thinking. So why don't I ask if General McConville can speak in a little bit more detail to your timelines.

General McCONVILLE. Senator, as we lay out in the strategy, we have an administrative headquarters right now in Alaska. We see that becoming an operational headquarters. How that actually kind of works out, we have got other operational headquarters similar to maybe what is in Italy right now. It is not a division, but it is an operational headquarters, has the ability to respond and command and control troops. That is what General Eifler will set up and that is in the process of being done.

We are taking a look at how we equip really the Striker Brigade with the appropriate equipment, because the strikers are a great capability, but it is not really designed to operate 12 months a year up in Alaska. So we are taking a look at what that looks like and how we put that capability. We are also taking a look at—I was up in Natick, which is developing some really high speed cold weather gear. And that is the type of, gear we would like to get to that brigade so they can truly operate. They do a lot of great work up there, but how do we do that?

And then even looking at what type of people do we recruit for that brigade? You know, people that live there. You know that we can reach out to people that would be very—we really want to go and work in that environment. So the States and certainly Alaska, where we can write contracts. If you want—we will guarantee you are going to serve in this area. You can do those type things.

We are taking a look at a, potentially a multi-main task force. What that looks like, you know, is we have the capability for anti-access area denial capability, working that with NORTHCOM. So all these things are kind of coming together. And as we do the posture review, as we look at the resources available, that will all drive this as we move out over the next couple of years.

Senator MURKOWSKI. Well, it is really encouraging to hear you say this, because it is really all encompassing. It is looking at the assets, the equipment that we need to have. And I want a little bit of an update on where we are with this bridging the gap between

the SUSV (Small Unit Support Vehicle) and the CATV (Cold-weather All-Terrain Vehicle). We recognize that you have got to have the equipment, but if you don't have the gloves and the gear and everything that you need in an Arctic environment, it is pretty tough even to operate the equipment that we are talking about. So things like clothing are actually pretty important.

So, again, it was good to hear Senator Shaheen even acknowledge that. But I am really intrigued about the focus on what you are calling focused recruiting, looking at men and women who perhaps come from a part of the country where it is mountainous, it is cold. You have got, perhaps not Arctic conditions, but you are used to the cold.

I think we recognize that part of the quality of life initiatives that we deal with in a place like Alaska, it is really hard with certain individuals and their families when you have never, ever, ever had an exposure to the cold, to the dark, to snow, and then we plant you there and say, go off and do your job. And it is challenging. And I think we see this in some of the issues that we have been facing. We have had an opportunity to talk about this spike in soldier suicide.

That is something that we have got to get our arms around. But I really appreciate that from a strategy perspective, it really is a much more broad and encompassing. I have kind of dangled the question about the SUSV and the CATV. I am over time. But if you have a quick update on that?

General McCONVILLE. I know right now we are in the process of—and I have got to be careful—we will come back with an answer on that. I know we are going through the process right now, and I am kind of concerned if I talk about the process I might not be doing what I should be doing. We will come back with an answer. And I know we are working on that right now.

Senator MURKOWSKI. I appreciate that, General. Thank you, Mr. Chairman.

Senator TESTER. Thank you, Senator Murkowski. As the Arctic becomes more and more real, which is real right now, the points you bring up are certainly valid and sign me up. That is all I got to say. I don't think I would meet the qualifications you need in the Army right now, but what the hell.

ADDITIONAL COMMITTEE QUESTIONS

We are going to close this out right now, and I really appreciate your testimony here today. Senators may submit additional written questions. And of course, we would ask you to answer those in a reasonable period of time.

[The following questions were not asked at the hearing, but were submitted to the Department for response subsequent to the hearing:]

QUESTIONS SUBMITTED TO HON. CHRISTINE E. WORMUTH

QUESTIONS SUBMITTED BY SENATOR RICHARD LEAHY

Question. Given the administration's priority of taking care of our people, and the important role that unit cohesion plays in improving readiness, it is crucial that the Army take a fresh look at policies and practices that may not support all

servicemembers. To that end, please outline what changes, if any, the Army has made, is making, plans to make, or is considering in order to:

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Answer. In 2020, the Secretary of the Army (SA) and the Chief of Staff of the Army (CSA) announced an effort entitled "Project Inclusion." Project Inclusion operationalizes the Army People Strategy: Diversity, Equity and Inclusion by organizing and leveraging resources across the Army to rapidly advance Assistant Secretary of the Army for Manpower and Reserve Affairs ASA(M&RA) prioritized efforts. The ASA(M&RA) signed the Army People Strategy: Diversity, Equity and Inclusion on September 1, 2020. The Army People Strategy fulfills the fiscal year 2020 National Defense Authorization Act, Section 529 mandate for the military services to develop a diversity and inclusion strategic plan by December 20, 2020. The five main goals of the plan include Leader Commitment, Talent Management, Organizational Structure, Training and Education, and Equitable and Inclusive Environment.

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Further, as safety is a priority when caring for all Soldiers through pregnancy and post-partum care, per established clinical practice guidelines, ensuring specialty referral needs are met is a part of prenatal and post-partum care. The standard of

care is applied to every servicemember and is tailored to the individual based on risk factors, including ethnicity.

QUESTIONS SUBMITTED BY SENATOR LISA MURKOWSKI

FUTURE OF WEAPONS

Question. Secretary Wormuth, the Chairman of the Joint Chiefs testified to our House counterparts in response to a specific question regarding maintaining a technological advantage that we are facing a rapid developmental convergence of an assortment of technologies including hypersonic weapons. He also said that “if we do not put a lot of money towards developing [hypersonic weapons] to a level of capability to deploy the joint force, we will be at a significant disadvantage to those countries that do develop them.”

Where does the Army see the biggest infrastructure or support challenges in developing our race to develop these weapons?

Answer. The biggest infrastructure or support challenges for hypersonic weapon development fall into two general categories: (1) the immature commercial industrial base; and (2) the Department of Defense (DoD) test infrastructure.

First, as part of the joint Army/Navy program, one of the Army’s assigned missions is to transition the Common Hypersonic Glide Body (CHGB) technology from Sandia National Labs (SNL) to commercial industry. The Army is executing this responsibility through a competitive industrial base selection using a “leader-follower” method with industry embedded with the government team at SNL. The industry team (the “follower”) is learning to build the CHGBs from the scientists at SNL (the “leader”). In parallel to the ongoing knowledge transfer activities, industry is building the necessary commercial production capability to support the CHGB demand signal. Upon completion of the commercial production facility, SNL will become the “follower” at the commercial facility with the commercial partner taking the role of the “leader.” The first CHGB produced wholly by industry will be delivered in fiscal year 2022.

Second, the current test infrastructure for hypersonics is challenged by the limited number of locations and each location’s available capacity. The hypersonic test need is a sub-set of the DoD test infrastructure, where all Services, as well as allied and partner nations, use the same assets across numerous programs, both hypersonic and conventional in nature. As the pace of hypersonic and long range missile testing accelerates, the test infrastructure must be expanded to meet projected demands.

Question. What is the Army’s current capacity to test hypersonic weapons and where are we doing so?

Answer. The current capacity for testing hypersonic weapons is challenged by the combination of multiple DoD programs, both hypersonic and conventional, that are concurrently in test phases, as well as supporting allied and partner nations testing. The Army uses high demand/low quantity testing assets for hypersonic weapons, such as arc jet heaters, wind tunnels, static ground testing facilities, and dynamic ground test infrastructure. The facilities, which are limited in availability by location and capacity, are required to validate designs, complete component testing, and conduct end-to-end weapon system testing. These limitations create a challenge of balancing the demands of not only the Army’s hypersonic needs, but also those of multiple Services. As the Army fields additional batteries, and new hypersonic technologies are developed across the Services, the facilities will continue to have issues with meeting the increased demand.

Due to the long corridors required for flight tests, the Army and Navy use locations such as the Reagan Test Site-Kwajalein, Pacific Missile Range Facility, Hawaii, Pacific Spaceport Complex, Alaska, and the Cape Canaveral Spaceport Complex, Florida.

Question. How does this budget request support the Army’s ability to develop and test hypersonic weapons?

Answer. The Army’s fiscal year 2022 budget request for the Army’s Long Range Hypersonic Weapon (LRHW) supports fabrication and assembly of major components of the system, including the missile stack, missile booster, and Common Hypersonic Glide Body (CHGB). The fiscal year 2022 request also supports industrial base activities for the commercial production line building the CHGB and completion of the first commercially produced CHGBs. The fiscal year 2022 funds support continued software and hardware testing and systems integration activities for the Transporter Erector Launchers (TEL) and Battery Operations Center (BOC).

The TELs and BOC will be fielded to the unit of action in the first quarter of fiscal year 2022 to begin Soldier training with the equipment.

Following the fielding, software development and hardware testing will continue to support upcoming flight tests and validate the mission planning concepts of operation.

The Army's fiscal year 2022 hypersonics budget request supports two major tests that will validate the configuration of the LRHW system. The Army will field the LRHW in fiscal year 2023, and Soldiers from the fielding unit will be deployed to support both of these tests. The Army will conduct these tests in conjunction with the Navy.

The Navy's hypersonic budget also supports the Army's LRHW effort, as the Army leverages the Navy's development efforts in their Conventional Prompt Strike Program. The Army and Navy are partnered to execute hypersonics through use of a CHGB, common missile design, common mission planning system, and joint test opportunities.

QUESTIONS SUBMITTED BY SENATOR LINDSEY GRAHAM

PALADIN INTEGRATED MANAGEMENT (PIM)

Question. Secretary Wormuth, The Army identified an Unfunded Requirement of \$149.5 million for the Paladin Integrated Management (PIM) program that when coupled with the fiscal year 2022 President's Budget Request, would procure up to 36 sets of equipment. However, this is still only a little more than half of the full rate production volume specified in the DoD approved acquisition program baseline of 60 sets per year. This lower volume will likely cause significant unit cost growth and workforce downsizing. Given this, can you tell me what the impact will be on fielding PIM to soldiers and on the industrial base by moving away from the current volumes of 44 to 48 PIM sets per year? Additionally, what analysis did the Army use to determine the Unfunded Requirement funding amount for this program?

Answer. The impact of reducing to 25 PIM sets per year is that the Army will procure one less Brigade Combat Team (BCT) set of PIM in fiscal year 2022, delaying the fielding of PIM to one BCT when the fiscal year 2022 procurements are delivered in fiscal year 2025. There are no anticipated impacts to the industrial base given that 25 sets is above the Minimum Sustainment Rate for production.

As for the Army's Unfunded PIM Requirement analysis, the Army forecasted in its fiscal year 2021 budget request the procurement of 43 sets in fiscal year 2022. However, based on the reduced Army topline and competing Army modernization priorities, the Army reallocated PIM funding to higher priority modernization efforts. The Army's Unfunded Requirement amount of \$149.5 million would restore the funding to its original fiscal year 2022 funding position and procure 43 sets.

QUESTIONS SUBMITTED TO GENERAL JAMES C. MCCONVILLE

QUESTIONS SUBMITTED BY SENATOR RICHARD LEAHY

Question. Over the last year the Army National Guard has demonstrated quite visibly that they have a connection with nearly every community in America. They are friends and neighbors who deliver food during the pandemic, or guarantee the right to safe and peaceful protest, or are there with drinkable water when the flood waters wipe out every other road to a town. The key organizing point they use for all these missions and more are Readiness Centers, which serve as the physical center point—the infrastructure, if you will—for everything they do for their communities.

After two decades of war, the list of Army construction and facility needs is extremely long, and there was a hearing last week to talk extensively about MilCon needs. But I wanted to hear from you, General, about what that construction means operationally.

What is the significance to a Guard unit of an up-to-standards Readiness Center—meaning everything from meeting safety regulations to having bathrooms for women, which too many of our readiness centers do not—for performing its various missions?

Answer. An “up to standards” Readiness Center is the result of an approved project that has been completed according to approved plans, specifications, criteria, and standards. These Readiness Centers allow Army National Guard units to store all equipment and materiel in one location for timely issuance to Soldiers and expedient mission readiness. This prevents the loss of valuable time spent retrieving

units' equipment from geographically dispersed sites and facilities. "Up to standards" Readiness Centers are also designed to include facilities, such as locker rooms and restrooms, for all Soldiers. The Army fully acknowledges that substandard facilities negatively affect Soldier quality of life and thus, recruiting and retention. The Army is aiming for Readiness Centers that ensure all Soldiers are provided the space to accomplish all mission functions for a timely and efficient Army response. This includes infrastructure that supports all communication and data systems for training, readiness, and response needs. In summary, Readiness Centers that are "up to standard" significantly increase the readiness of the National Guard.

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QUESTIONS SUBMITTED BY SENATOR PATTY MURRAY

Question. Joint Base Lewis McChord in my home state of Washington has received recent media attention highlighting the problem of food insecurity experienced by local military families. Research shows that as many as one in five military families in Washington state are experiencing food insecurity. And a recent Army study associates food insecurity with anxiety, depression, and suicidal thoughts. How is the Army engaging on the issue of food insecurity and helping those Army families in need?

Answer. The Army currently takes a multi-pronged approach to food insecurity among Soldiers and their Families. When the Army discovers that a Soldier or their immediate family is facing food insecurity, the Army initially connects the Soldier and family members to Army Emergency Relief and other community-based resources to address short-term financial emergencies. Next, the Army looks to provide individualized services to improve the Soldiers and Family’s long-term financial outlook. These services include Financial Readiness Program (FRP) counseling for Soldiers and Families, which helps families develop budgets, manage credit/debt, and identify how to best use their financial resources. The Army also provides education to all Soldiers through a standardized mandatory financial readiness curriculum that includes familiarity with assistance programs, such as the Supplemental Nutrition Assistance Program (SNAP) or the Family Subsistence Supplemental Allowance (FSSA). The Army also offers the Employment Readiness Program (ERP) to aid spouses in seeking employment to further improve the family’s total financial outlook. From a forward-looking organizational perspective, the Army continues to work with DoD on the on-going broad-based study of food insecurity among members of the Armed Forces and their dependents. This study includes an assessment of the feasibility of a new basic needs allowance, an assessment of the barriers (if any) to qualification for or access to adequate food assistance programs of any type, and an assessment of the participation of servicemembers in the SNAP. This study will better inform the path forward for the Army on this important issue. Congress is required OSD to submit a report based on this study by March 31, 2022.

Question. Another issue that demands Army attention is the lack of affordable housing at Yakima Training Center in central Washington. There is currently no military housing for families or unaccompanied personnel at Yakima, and off base, the vacancy rate for apartments and homes for sale is below 1 percent. The Army’s 2020 Housing Market Analysis for Yakima also showed there’s a housing shortfall. Assigned servicemembers at the Yakima Training Center clearly need more affordable housing. What is the Army doing to fix this?

Answer. The Army is exploring several options to address the lack of affordable housing at/near Yakima Training Center. The Army hired a housing manager at this location to assist Servicemembers and their families with their housing needs. The new housing manager is working to establish a Rental Partnership Program (RPP) with local rental property companies to provide Servicemembers with improved access to affordable housing. Additionally, the Army—in collaboration with local and state leaders—continues to evaluate other housing solutions within the Yakima area.

QUESTIONS SUBMITTED BY SENATOR JEANNE SHAHEEN

GRENADIER SIGHTING SYSTEM

Question. The Grenadier Sighting System is a critical piece of technology that provides soldiers with invaluable day and night-time fighting capabilities for the M320 Grenade Launcher. I understand that the Army has procured 73,000 M320s, but the system remains without a nighttime fighting capability. Can you please provide the acquisition plan for the Army's procurement of the Grenadier Sighting System for Close Combat Forces and the rest of the Army?

Answer. The current Army Acquisition Objective for the Grenadier Sighting System (GSS) is 73,024 systems. The GSS is currently planned to serve as a 1-to-1 component to the M320 Grenade Launcher. The Army has a Firm Fixed Price Contract with Wilcox Industries to procure the GSS, and 19,427 of GSS have been procured to date.

QUESTIONS SUBMITTED BY SENATOR MITCH McCONNELL

EUROPEAN DETERRENCE INITIATIVE

Question. V Corps, including its rotational force in Poland, provides the United States and our allies with key capabilities to promote interoperability, counter malign influence, and deter aggression in Europe. Will proposed budget cuts to the European Deterrence Initiative diminish Army's capacity to maintain and strengthen these important capabilities?

Answer. The Army will continue to maintain and strengthen its deterrence posture in Europe within current resourcing. V Corps serves as the higher headquarters command for assigned and rotational land forces in Europe. V Corps' activities are largely funded through the EDI. This includes exercises, a forward rotational presence, key infrastructure investments, and prepositioned equipment.

FUTURE VERTICAL LIFT (FVL)

Question. Does Army's budget request for fiscal year 2022 include the necessary resources to field FVL platforms by 2028?

Answer. The current fielding plan for both the Future Attack Reconnaissance Aircraft (FARA) and the Future Long-Range Assault Aircraft (FLRAA) will enable the "first units equipped" in fiscal year 2030. The Army remains committed to long-term affordability of both FARA and FLRAA. This commitment includes goals and caps on Average Procurement Unit Cost (APUC) and Operations and Sustainment (O&S) costs, which serve as the long-term measures of affordability.

At this time, the Army supports continued funding for FVL programs based on the transformational capability they will bring to the joint force in multiple theaters.

Question. What role will the 101st Airborne Division and 160th Special Operations Aviation Regiment have in flying or testing new vertical lift platforms?

Answer. Soldiers from the 101st Airborne Division and the 160th Special Operations Aviation Regiment are, and will continue to be, part of Soldier-centered design efforts to fly and test new vertical lift platforms. The Army employs a Soldier-centered design in the following ways: (1) the identification and validation of operational gaps, (2) the development of requirements, (3) the development and testing of new operational concepts and doctrine, (4) the development, evaluation, and modification of prototypes, and (5) the operational test and evaluation of potential future capabilities. The Army incorporates Soldier feedback as well as lessons learned. Critical and continuous feedback from Soldiers—many with significant recent combat experience—plays a critical role in our efforts to "drive and fly before we buy."

Soldiers from across the force, both conventional and special operations, will continue to participate in Soldier touch points from the requirements definition phase to the fielding of new capabilities phase in order to ensure combat overmatch against our adversaries.

Question. What military construction and other facility improvements are needed to accommodate FVL platforms at Fort Campbell? If further review is needed to determine these improvements, when do you expect to conclude those reviews?

Answer. The Army is assessing 19 active and reserve component aviation installations that are under consideration for the stationing of Future Vertical Lift (FVL) aircraft, including Fort Campbell, Kentucky. This assessment includes evaluating all requirements necessary to train, maintain, and deploy these future aviation formations based on the projected FVL capabilities. Not only is the Army evaluating facility requirements, but the assessment team is also reviewing 17 major areas, in-

cluding hangar, airfield, airspace, and training area capacity; live fire range capabilities; and support facilities. The facilities review alone includes more than 40 sub-areas to ensure that the existing facilities can support the maintenance and support requirements for the FVL aircraft. We expect to complete the compilation of the information by the end of fiscal year 2021 and the assessment will identify construction and other improvement requirements for not only Fort Campbell, but for all installations, in order to inform the fiscal year 24–28 Program Objective Memorandum (POM) cycle submission.

BLUE GRASS ARMY DEPOT (BGAD)

Question. Please provide an update on Army's review of potentially reusing certain equipment for BGAD's conventional operations that have supported its chemical weapon mission.

Answer. The Army continues to review the potential for reusing certain equipment from the Blue Grass Army Depot's (BGAD) chemical weapon demilitarization operation for BGAD's conventional weapons operations. This review will continue until the chemical weapon operation is completed.

Question. It is my understanding that some equipment currently supporting BGAD's chemical demilitarization operations may be environmentally advantageous for the installation's conventional mission. How will Army decide which equipment to transition from BGAD's chemical mission to its conventional operations?

Answer. DoD and Army regulations, legal requirements, safety considerations, and historical practices will be used to evaluate the potential of equipment for reuse. The Assembled Chemical Weapons Alternatives (ACWA) Program can only transfer property that is "safe to use" for additional duties. There is an established process for property disposition. The type of property determines the process. For example, buildings and equipment where chemical munitions were present but where there was no contamination (e.g., container handling building) fall into the SOME REUSE category. Buildings and equipment not contaminated and without potential to be contaminated (e.g., maintenance building) fall into the MOST OFTEN REUSE category. As part of the Army's Organic Industrial Base modernization strategy, over the next 15 years, the Army will ensure Blue Grass Army Depot is capable of sustaining readiness, is capable of supporting modernization efforts, and is postured to meet future wartime requirements.

Question. What measures is Army taking to offset potential negative economic impacts to the local community that may result from the conclusion of BGAD's chemical demilitarization mission?

Answer. In order to assess the impact to the local community, the Economic Impact Working Group uses a collaborative and transparent effort among local governments, Kentucky's congressional delegation, chambers of commerce, industry, the Department of Defense (DoD), the Department of the Army, the Kentucky Cabinet for Economic Development, the Bluegrass Area Development District, and the Bechtel Corporation (Blue Grass Chemical Agent-Destruction Pilot Plant's (BGCAPP) primary contractor). As mission completion approaches, the future economic impacts resulting from the conclusion of BGAD's chemical demilitarization mission are being closely scrutinized.

To help protect the community against those impacts Army is proactively coordinating with DoD's Office of Local Defense Community Cooperation (OLDCC). The Blue Grass Area Development District requested planning assistance in December 2020 and the OLDCC is considering a broad economic adjustment planning effort to stabilize the local economy through the conclusion of BGAD's chemical demilitarization mission.

FORT CAMPBELL

Question. Fort Campbell currently has a significant deficit of tactical equipment maintenance facilities (motor pools), and 12 of the existing facilities were built during the Korean War. What is Army's plan to construct additional motor pools that are large enough and properly equipped to perform maintenance on modern vehicles at Fort Campbell?

Answer. The current ten-year Army Facility Investment Plan (FIP), led by U.S. Army Materiel Command, includes building two tactical equipment maintenance facilities at Fort Campbell to address existing facility deficits. Additionally, two emerging tactical equipment maintenance requirements have also been identified and will compete for Military Construction funding between fiscal year 2023 and fiscal year 2031.

Question. What is Army's plan to renovate Fort Campbell's outdated 1st BCT VOLAR barracks, which were built in the 1970s?

Answer. The current ten-year Army Facility Investment Plan (FIP) includes Restoration and Modernization (R&M) projects to renovate all 13 1st Brigade Combat Team (BCT) Volunteer Army (VOLAR) barracks. There are four unaccompanied housing R&M projects programmed in fiscal year 2021 and fiscal year 2022. The funding for the two fiscal year 2021 projects was released on Feb. 4, 2021, and the two fiscal year 2022 projects, based on our fiscal year 2022 budget request, are expected to be released and awarded no earlier than the second quarter of fiscal year 2022. The remaining nine 1st BCT VOLAR barracks are slated to be addressed between fiscal year 2023 and fiscal year 2031.

ABILITYONE PROGRAM

Question. It was recently announced that Army plans to use intergovernmental support agreements (IGSAs) instead of the existing AbilityOne contracts for custodial services at Fort Campbell and Fort Knox. Does Army policy allow for the use of IGSAs instead of AbilityOne contracts where cost-savings can be achieved? What is Army's plan for future participation in the AbilityOne Program, which employs people who are blind or have significant disabilities to provide custodial, grounds keeping, food, and other services on Army installations?

Answer. The Army has not made a decision to enter into an IGSAs for custodial services at either Fort Campbell or Fort Knox. The IGSA authority (10 U.S.C. 2679(a)(1)) allows the Department of Defense to enter into an IGSA with a state or local government that can deliver installation support services more efficiently and at a lower cost. Neither the law, nor Department of Defense or Army policy, prohibit the use of an IGSA in lieu of an AbilityOne contract when the Secretary determines that doing so is in the best interests of the Army by enhancing mission effectiveness or creating efficiencies or economies of scale, including by reducing costs. The U.S. Army Installation Management Command (IMCOM) continues to be one of the largest supporters of the AbilityOne Program in the United States Army and Department of Defense. IMCOM's contract portfolio contains 71 contracts set aside for AbilityOne with a total contract value of \$1.7 billion. According to SourceAmerica data, these IMCOM contracts employ 2,318 Disabled Full Time Equivalent employees. Each proposed IGSA receives a thorough review for cost savings and overall benefit to the government. For proposed IGSAs that would displace an incumbent AbilityOne contractor, IMCOM also reviews the IGSA proposals to determine if there is a firm commitment from the state or local government hire the incumbent Ability One contractor's workforce. When otherwise in the best interests of the Army, the Army will continue to use IGSAs to obtain installation support services if IMCOM obtains a firm commitment from the respective state or local government regarding their hiring plans for incumbent contractor employees, especially those who are disabled.

QUESTIONS SUBMITTED BY SENATOR SUSAN M. COLLINS

ROBOTIC COMBAT VEHICLE PROGRAM

Question. With regard to the Army's robotic combat vehicle plans, how often does Army Futures Command evaluate autonomous ground vehicle experimentation efforts?

Answer. The Army's autonomous ground vehicle experimentation plan relies on tabletop exercises, virtual environments, and physical experimentation. Soldier feedback is critical to determining both future use cases and vehicle requirements. Major virtual experiments (where Soldiers control robotic combat vehicles in a simulation environment) occur approximately every 6 months, while physical experiments average once every three to 4 months. In addition to Soldier feedback, multiple technology assessments evaluate the software that enables the vehicles to operate autonomously. Further, independent evaluators determine if new software is adequately mature to integrate into a future Soldier operational experiment. If so, Soldiers then evaluate the new software in a relevant tactical environment and provide their comments to developers, who improve the existing software in accordance with the Soldier feedback and the performance data.

Experiments that have occurred over the past 2 years include, the Robotic Combat Vehicle (RCV) Soldier Operational Manned-Unmanned Teaming Experiment that took place at Fort Carson, Colorado, from July-August 2020. Additionally, RCV surrogates ("Project Origin") supported Project Convergence at Yuma Proving Ground from September to October 2020. These same systems then went to Fort Benning, Georgia for a three-week Soldier experiment in November 2020. The same Soldiers who operated the Project Origin platforms at Fort Benning then supported a live

fire at Camp Grayling, Michigan, in April 2021. The next Soldier operational experiment will occur in September 2021 at the Joint Readiness Training Center, located at Fort Polk, Louisiana.

Question. How do these evaluations differ, if at all, from existing program evaluations and review processes resident within the Department of the Army's acquisition community?

Answer. Robotic Combat Vehicle experimental evaluations follow the same processes used in the Army's acquisition and test communities. The Army enterprise breaks down learning objectives to support data collection and analysis after each experiment. Results from each experiment then inform both learning objectives and development priorities for the next experiment, as well as program planning for future acquisition programs of record.

Question. In the event separate but concurrent program and experimentation reviews come to different conclusions, what is the impact to resourcing decisions for the programs and experimentation efforts in question?

Answer. Any potential impact to Army resourcing decisions because of different conclusions from concurrent program and experimentation reviews will depend on the conclusions themselves and their impact on cost, schedule, and performance. The RCV program strives to minimize concurrent platform prototype development until Soldiers evaluate the platforms and their capabilities in a relevant operating environment.

QUESTIONS SUBMITTED BY SENATOR LISA MURKOWSKI

POSTURE REVIEW

Question. General McConville, during testimony you mentioned that the current Posture Review would have you looking at your resources available and drive your decisionmaking on re-aligning headquarters and forces in Alaska as you transition them from an administrative headquarters to an Arctic focused operational headquarters 1a. When is the current Posture Review expected to be completed, and where is the Review in the process now?

Answer. The Global Posture Review (GPR) is an Office of the Secretary of Defense (OSD) process and it is in the final review stages of review prior to a decision by the Secretary of Defense.

Question. Following the Posture Review, what will be the process for making these force realignment decisions, and when would we actually see results of these decisions take effect?

Answer. Following the Posture Review, the Army will use the Total Army Analysis (TAA) process to inform realignment decisions. Those decisions are typically announced in the first quarter of the fiscal year.

ARCTIC OVERLAND MOBILITY VEHICLE

Question. General McConville you also acknowledged during the hearing you would provide an update on the Cold Weather All-Terrain Vehicle ("the CAT-V"). Can you please provide me an update on the Phase II "Production" timeline and is there any indication that the fiscal year 2023 target of equipping units with the CAT-V has slipped?

Answer. At this point, the Army has seen no indication of any slippage in the current schedule. A Production Award is scheduled for June 2022 with first production vehicle delivery in August 2023.

Question. If it has slipped, has this been addressed in the fiscal year 22 budget?

Answer. The Army has seen no indication of any slippage in the current schedule.

Question. When will these new CAT-Vs be fielded? Will they go to Alaska-based troops?

Answer. The CATV will begin fielding in fiscal year 2023, with the first unit equipped expected in the fourth quarter of fiscal year 2023. The CATV program is on schedule to conduct cold weather testing in fiscal year 2022 and begin production in fiscal year 2023. As this vehicle is crucial for the Arctic Soldier and their mission, Alaska-based troops are expected to be part of the fielding plan.

ARCTIC ORGANIZATION CLOTHING AND INDIVIDUAL EQUIPMENT (OCIE) FOR FT DRUM, FT CARSON, AND ALASKA BASES

Question. Unique clothing and equipment for the Arctic (mittens, boots, sleep systems) to ensure soldier safety and readiness for units assigned to train and deploy to Arctic locations has been identified as an unfunded requirement in this budget. Congress not funding proper winter clothing for our Army has been an issue dating

back to Valley Forge and Morristown, and I'd hope we'd have learned that lesson by this point. The cold weather sustainment items ensure safety and readiness for soldiers assigned to the Arctic, and as we pivot to conducting more training and operations in the region I would imagine they are crucial to our abilities to do so.

General McConville, can you identify concisely the degradation to readiness if we are unable to outfit all our soldiers assigned to train and deploy in the arctic environments in this budget cycle?

Answer. The Army equips and trains to fight under any environmental condition. Arctic conditions are challenging, but commanders are responsible for ensuring readiness for the conditions of the operational environment when deployed. This includes assessing the risks associated with an Arctic environment and taking actions to mitigate the risk of injuries or accidents due to cold weather while still accomplishing the assigned mission. These actions include training on how to use cold weather clothing and equipment properly, as well as preventing and treating cold weather injuries. The current Army procurement strategy is to equip select active duty and National Guard units that are specially trained to operate in Arctic environments, with improved cold weather equipment. Approximately 3 percent of our total Army (all components) is outfitted today to operate in Extreme Cold Weather (ECW) or Arctic regions of the world. The Army has issued guidance to improve upon the ability to operate in Arctic conditions, while assessing the risk across all other requirements within the equipping enterprise of the Army. I expect that this new guidance will be addressed in Program Objective Memorandum, fiscal year 2024–2028.

Question. Is there legacy equipment that would or could be used, or is this a “show stopper” for various exercises and operations you have planned either internally or with partners and allies?

Answer. Currently available clothing and equipment allows Soldiers to conduct all necessary exercises and operations. All Soldiers have components of the Extended Cold Weather Clothing System (ECWCS). This system allows Soldiers to use layers to provide adequate protection from temperate to arctic weather conditions. All Soldiers have elements of the ECWCS that allow them to operate from temperate to cold weather conditions.

Additionally, ~40,000 Soldiers have the components of the ECWCS that allow them to operate in extreme cold weather, including climate zones 6 (extreme cold weather) and 7 (Arctic weather). These ECWCS components comprising Layer 6 and Layer 7, include insulated gloves, trigger finger mittens, insulated mittens, cold weather boots, CW/ECW socks, boot gaiter, and a balaclava. Deliveries are expected that will outfit an additional 50,000 Soldiers for next winter.

SUBCOMMITTEE RECESS

Senator TESTER. The Defense subcommittee will reconvene on Thursday, June 24, at 10 a.m. to hear from the Navy and Marine Corps leadership on fiscal year 2022 Department of Navy budget request. With that, this subcommittee stands in recess. Thanks, guys.

[Whereupon, at 11:09 a.m., Tuesday, June 22, the subcommittee was recessed, to reconvene at 10 a.m., Thursday, June 24.]

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 2022

THURSDAY, JUNE 24, 2021

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 10 a.m., in room SD-192, Dirksen Senate Office Building, Hon. Jon Tester (chairman) presiding.

Present: Senators Tester, Murray, Schatz, Baldwin, Shelby, Collins, Blunt, and Moran.

DEPARTMENT OF DEFENSE

DEPARTMENT OF THE NAVY

OFFICE OF THE SECRETARY

STATEMENT OF HON. THOMAS W. HARKER, ACTING SECRETARY

OPENING STATEMENT OF SENATOR JON TESTER

Senator TESTER. I want to call this subcommittee meeting to order.

Let me begin by welcoming our witnesses. Acting Secretary Harker, this is your first appearance before the Senate Appropriations Committee and I welcome you.

Admiral Gilday and General Berger, you were both here last year for the last live hearing before the pandemic, so welcome back. It is good to host you in person.

I think we can all agree that China is a current-pacing threat and that the pace is a run, if not a full-out sprint.

So, how are we keeping up? The Navy and Marine Corps are facing the current challenges with different approaches. On one hand, the Marine Corps has taken major steps to reshape its force for the future based on General Berger's strategy to self-fund the reforms.

On the other hand, the Navy is faced with the balancing act between the substantial cost of maintaining a fleet of nearly 300 ships and the additional cost of modernizing to meet the threats of the future.

The Navy's 2022 budget protects readiness in order to deliver a combat-credible force. As for the future, the path is less clear. Secretary Harker has reportedly found that plans to design new destroyer submarines and jets all at the same time are unaffordable.

So, how do we increase our pace to keep up with the threat? For the Navy, I understand there are ongoing reviews on what the fleet of tomorrow should look like. I would add that, no matter what you

find in those studies, holding people accountable, whether it is government or civilian, for delays in ship deliveries or increase in weapons costs has to be part of that solution.

The committee is eager to work with you to find the right balance between modernization, or between modernizing and maintaining the force and fleet that we have.

Once again, I want to thank the witnesses for their testimony that they are about to give today and look forward to hearing from each one of them.

With that, I will turn it over to you, Senator Shelby.

STATEMENT OF SENATOR RICHARD C. SHELBY

Senator SHELBY. Thank you, Mr. Chairman. I will try to be brief.

Welcome. I welcome you, too, Mr. Secretary, Admiral, and General Berger. Thank you for being here.

We all look forward to hearing about the Navy and the Marine Corps' budget proposal for 2022. This discussion is particularly important, I believe, because the Navy's budget proposal reflects a meager 1.8 percent increase from fiscal year 2021 while reducing the end strength in procurement investments. The reductions are proposed despite the need to maintain readiness and make progress on key modernization priorities, like the Navy's leg of the nuclear triad and the introduction of a new weapons system.

In addition to other deficiencies in the Navy's budget proposal, I believe this budget fails to include funding to support the multi-year procurement contract for the DDG-51, which reflects poorly, I believe, on the Department's view of its commitments to Congress and its long-term ship-building plans.

It also calls into question the seriousness with which this Administration approaches defense-related funding decisions given that the DDG-51 appears as the Navy's top priority on its unfunded requirements list.

You are all very well aware that our adversaries, including China and Russia, pose new and increasing threats, and they will grow. They are making unprecedented investments in their capability and capacity, investments that this budget does not even come close to matching.

I believe that this budget, which fails to even keep pace with inflation, sends the wrong message to our allies and our adversaries. I am interested in hearing how the 2022 budget request fully meets, if it does, the needs of the Navy and Marine Corps while maintaining our advantage over our adversaries. It will be an interesting discussion.

Thank you, Mr. Chairman.

Senator TESTER. Thank you, Senator Shelby.

We will start out with you, Secretary Harker.

SUMMARY STATEMENT OF HON. THOMAS W. HARKER

Secretary HARKER. Chairman Tester, Vice Chairman Shelby, distinguished members of the committee, thank you for your bipartisan support on behalf of our sailors, marines, and civilians. I am honored to be here with General Berger and Admiral Gilday. I support their efforts to build a more integrated, all-domain naval force through the NAVPLAN and the Force Design 2030.

In order to move these plans forward within existing resources, we have had to make some very hard choices in this budget, but that is exactly what the American people expect us to do. Every dollar is a strategic asset that must be maximized to stay ahead of the pacing threat of China and the many other challenges facing our fleet and our Nation.

Every investment must be done in a balanced and sustainable manner to ensure we maintain the readiness of our current fleet, while building the capacity and the capability we will need in the future. The cost of readiness is increasing. Personnel and maintenance costs have grown at a rate that is well above inflation. This growth squeezes the rest of our budget.

In order to maintain our readiness, we have had to delay some of our planned ship purchases to future years. In order to invest in a superior future force, we have had to divest of less-capable assets. These were not easy choices, but we cannot create a hollow force that does not train our sailors or Marines, or which leaves holes in units, or does not provide for sufficient crew rest. We have learned those lessons through the tragic mishaps that have occurred over the last 5 years.

In order to ensure future availability and readiness of our fleet, we are prioritizing investments in our physical infrastructure, including full commitment to the Shipyard Infrastructure Optimization Program.

I have visited all four of our public Navy shipyards, as well as most of the private shipyards, and other commercial facilities. It has been an inspiration to shake the hands of the men and women who are building and maintaining our fleet.

I have had the opportunity to speak with every level of labor and management about the issues they face, and the need for consistency in funding and demand. That is why we are increasing the capability and resiliency of these century-old installations, increasing the size and capability of our dry docks, and equipping our 40,000-person workforce with the tools they need to maintain our new, more lethal assets.

To ensure our resources reach the warfighters who need them, we are demanding rigorous self-assessment and responsive accountability in every part of our enterprise through the Performance to Plan initiative. This effort has improved our readiness of our strike fighters and is being rolled out successfully across the fleet in other areas.

As good stewards, we are on the right path towards obtaining an audit opinion for the Navy and Marine Corps General Funds and the Department's Working Capital Fund. We are the only military department that has eliminated audit material weaknesses—three in the Navy, one in the Marine Corps—and are leading the way on this critical effort.

This has enabled us to improve cybersecurity in our business systems. Since 2017, the Marine Corps has closed 41 out of 110 IT findings, 17 of which were cybersecurity related.

We are also increasing investment in the Department's oversight functions, while maximizing the return on our investment in the performance audit process.

Effective use and management of data is key to our digital transformation and will change how we will fight and win at every level. This requires the modernization of our information technology infrastructure, which is a critical war-fighting priority for our department.

We are also prioritizing the mental health of our force, speaking out at the senior level about the benefits of counseling and ensuring the availability of counselors, chaplains, and other professionals. We appreciate the committee's attention to this vital issue and your support in providing additional mental health support to our sailors and Marines and our forward operational units.

We are fighting the scourge of sexual harassment and sexual assault through efforts like the Watch List, a tool that uses Navy and Marine Corps data to alert commanders to conditions in their units that may lead to these toxic behaviors. We are increasing investment in this area, focusing on the prevention of and response to sexual harassment and assault.

In this fiscal year 2022 budget, we have added over 200 personnel across the Navy and Marine Corps focused on prevention. The majority of these personnel will be placed at Navy and Marine Corps installations, working with sailors and Marines.

We are also adding an additional 80 sexual assault response coordinators for the Marine Corps, as well as 18 Navy criminal investigative service personnel dedicated to a sexual assault prevention and response.

Secretary Austin's 90-Day Independent Review Commission has completed its work, and we look forward to implementing the Secretary's forthcoming recommendations to make meaningful and lasting progress in this area.

Around the world and around the clock, the sailors, Marines, and civilians of our integrated naval force stand the watch and execute the mission. On behalf of each of them and their families, I thank you for your time, oversight, and appropriations. I look forward to your questions.

[The statement follows:]

PREPARED STATEMENT OF HON. THOMAS HARKER

Chairman Tester, Vice Chairman Shelby, distinguished Members of the Committee, thank you for the opportunity to discuss the posture of the Department of the Navy (DON). I appreciate the hard work of the Members and Staff of this Committee to ensure funding stability and principled oversight for every Sailor and Marine now standing watch around the world.

The reemergence of long-term strategic competition from China and Russia is spurring a period of rapid transformation in the global security environment. The disruptions related to the COVID-19 pandemic underscore the need for agility and distributed readiness. Climate change is accelerating, and its impact on both our planet and force will continue to grow as significant weather events threaten our infrastructure, and the arctic opens to unprecedented activity.

In a world more interconnected and interdependent than ever before, a fully integrated and forward maneuverable Navy-Marine Corps Team has never been more important to the security of our Nation and the preservation of the rules-based international order. We must protect our nation, our allies and partners, and our global interests, while also leading on the urgent issues facing our personnel and planet, from the mental and physical health care needs of our people, to the scourge of sexual assault and harassment, to the need for diversity and inclusion at every echelon, to the ongoing threat of climate change.

General Berger, Admiral Gilday, and I stand united in our resolve to ensure your DON will be ready for the global challenges before us with the personnel, platforms,

and technology to secure vital sea lanes, stand together with our allies, and protect the United States of America.

DEFEND THE NATION

The President's Budget submission for FY 2022 (PB22) reflects hard choices to divest of less capable platforms and systems to invest in a powerful and superior future force. Throughout the budget process and in all aspects of capability acquisition, design, construction, and deployment, we must balance the urgent readiness needs of our force today with investments in the future force and effective business process reforms in order to ensure our Sailors and Marines are always ready to fight and win in any clime or place.

Force Posture

The presence and availability of naval forces must always reflect the strategic needs of the Nation, providing effective options for the President and Secretary of Defense to counter every challenge. To ensure preparedness, the DON provides maximum operational flexibility through warfighting concepts including Distributed Maritime Operations, Littoral Operations in a Contested Environment, and Expeditionary Advanced Base Operations, ensuring continual overmatch and flexibility in the battle space.

Secretary Austin has identified China as the pacing threat for our military forces, and we will continue to position our integrated global maritime force to lead in the Indo-Pacific. But ours is a global force with global responsibilities, including increased Russian presence in the Atlantic, terrorism and instability in the Arabian Gulf, an increasingly blue arctic, a global need for agile and ready Marine forces to respond to the unexpected in every domain, and the constant threat of cyberattacks to our force, support infrastructure, industrial base, and supply chain.

The DON FY22 budget request delivers ready maritime forces through sustained investment and performance improvement, developing more lethal, networked capabilities and concepts, closely integrated between the services and with our joint force and government partners. Within limited resources, we will field the right platforms and capability to maintain freedom of the seas, support international law, and stand by our allies as we continue to fly, sail and operate wherever international law allows.

That spirit is reflected in the guidance put forth by our services. I support Admiral Gilday's Navigation Plan, which refocuses our integrated all-domain naval power on the core functions of sea control and power projection we need to compete and win. It places a high priority on a more lethal and better connected fleet to project power from blue water, to the littorals, to the shoreline and beyond.

The guidance centers on four lines of effort:

- Deliver a More Ready Fleet. Deliver a Navy that is organized, trained, and equipped to deploy forward and win in day-to-day competition, in crisis, and in conflict.
- Deliver a More Lethal, Better-Connected Fleet. Deliver a Navy capable of projecting synchronized lethal and non-lethal effects across all domains.
- Deliver a Larger, Hybrid Fleet. Grow a larger, hybrid fleet of manned and unmanned platforms—under, on, and above the sea—that meets the strategic and operational demands of our force.
- Develop a Seasoned Team of Naval Warriors. Develop a dominant naval force that can outthink and outfight any adversary.

To meet the forward maneuverable force requirements of the Joint Force long into the future, the Marine Corps has put into motion an aggressive modernization of the Service. I support General Berger's Force Design 2030, which is not simply an improvement on its existing form and function. It is a transformational effort rooted in the anticipated challenges of the future operating environment. Building on the cooperative efforts of all of our sea services, the Marine Corps is reinvigorating the Fleet Marine Forces within existing resource constraints as an indispensable element to global maritime operations.

The goal of Force Design 2030 is to provide a Marine expeditionary assets that will:

- Successfully compete with peer adversaries in the maritime gray zone
- Deter, and if required, fight and win in support of naval campaigns
- Facilitate sea denial and sea control
- Win the reconnaissance and counter-reconnaissance competition
- Persist inside actively contested spaces
- Be capable of "rapidly sensing, making sense of, and acting upon information" inside an adversary's weapon engagement zone.

Across both services and throughout the DON, we are executing force designs centered on Naval Expeditionary force deployment, giving us a sustainable edge and a resilient capability to deliver the integrated all-domain naval power required by the Joint Force. We are investing in the readiness of the integration-ready platforms to ensure continued freedom of action throughout the maritime domain, from amphibious and ground element equipment, to agile warships and submarines, to dominant aircraft carriers and air wings. Successful implementation of the concepts within the Navigation Plan and Force Design 2030 will be pursued through a unified, integrated effort at every echelon.

Maintain the Edge

We greatly appreciate the Committee's efforts to ensure funding stability and predictability over the past several years. This has given our force the agility and flexibility needed to address emerging threats, to invest in critical future capabilities for our integrated naval force, while shifting away from less beneficial spending.

The DON is building on this foundation by aggressively pursuing better readiness, lethality, and capabilities in those areas of warfighting technology showing the greatest promise of delivering non-linear warfighting advantages. From artificial intelligence and cyber weapons to unmanned platforms and directed energy, we are on the cusp of technological breakthroughs that will define future conflict. Our future force will be defined by our decisions today.

We will continue to invest in key naval capabilities to control the seas and project power in every domain. We will field a resilient, networked, and dispersed fleet, connected through the Naval Operational Architecture to provide decision advantage in contested environments. We will continue to invest in advanced technologies such as long range hypersonic and directed energy capabilities to ensure maximum reach, survivability and decision space for our forces.

Our number one shipbuilding priority remains resourcing *COLUMBIA SSBN* for on-track delivery in order to ensure the future strength of the most survivable leg of our Nation's nuclear triad. We are also advancing our asymmetric undersea attack advantage through the Tactical Submarine Evolution Plan, including follow-on Blocks VI and VII of the *VIRGINIA* Class, and the SSN(X) program. We are advancing battle force shipbuilding programs such as the *CONSTELLATION* class frigate and the *GERALD R. FORD* class carriers, as well as enhancing our fleet capabilities through additional battle force ships.

We are also extending the reach of our warriors from the sea with the addition of sea-based platforms such as *USS MIGUEL KEITH*, our third Expeditionary Sea Base, which was commissioned on May 8th. To ensure our Marines maintain their edge, we will continue to invest in key Marine Corps development programs that support the Marine Corps Force Design concept, such as the Ground Based Anti-Ship Missile, Ground Based Air Defense, Medium Altitude-Long Endurance Unmanned Aerial System, Long Range Unmanned Surface Vessel, and the Light Amphibious Warship. These enhance the ability of Marines to maneuver and deter competitors within range of enemy weapon systems.

Targeted investments in key emerging technologies and capabilities will enhance and sustain amphibious battlefield maneuverability ashore and superiority at sea, with the support of properly resourced facilities, infrastructure, and systems to sustain our frontline forces.

Continual Readiness

Hard experience has shown long term readiness cannot be sustainably achieved through "can do" and "make do" improvisation. Our front line personnel may be determined, adaptive, and skillful enough to get the job done in the face of equipment shortfalls and intense battle rhythms, but relying on their adaptability is no substitute for genuine fleet readiness. We owe it to the Sailors and Marines out in the fleet to make sure they always have the tools they need to do the dangerous jobs we ask of them.

The changes generated from the Readiness Reform and Oversight Council (RROC) and other introspective efforts have enabled us to improve readiness, training, and maintenance processes at every level. For example, we've implemented a uniform readiness assessment and certification process that must be followed before a ship can be certified to return to the fleet. We have also increased opportunities for shipboard certification and skills enhancement, while adjusting manning schedules to maximize safety and improve quality of life and professional effectiveness for our personnel while underway. These and many other changes will result in a better prepared and equipped force.

We continue to build on our efforts to increase availability, improve maintenance, and maximize throughput, by making targeted shore investments designed to in-

crease fleet readiness. The Navy's four public shipyards—Norfolk Naval Shipyard, Portsmouth Naval Shipyard, Puget Sound Naval Shipyard and Intermediate Maintenance Facility, and Pearl Harbor Naval Shipyard and Intermediate Maintenance Facility—are critical infrastructure elements of America's national defense. In order to improve naval maintenance production capacity at these facilities, the DON is fully committed to the Shipyard Infrastructure Optimization Program (SIOP), comprising three primary focus areas: dry dock recapitalization, facility layout and optimization, and capital equipment and modernization. The DON is dedicating the resources and oversight necessary to ensure the required maintenance is completed across all shipyards as quickly as possible, and has established a Program Office (PMS-555) to ensure integration of all elements of the plan.

Building on the successful Naval Aviation Enterprise efforts to meet Strike Fighter aircraft availability goals for both the Navy and Marine Corps, we are targeting greater aviation readiness across the force, incorporating commercial best practices to improve performance. Through the Performance to Plan initiative we're using data driven decision making to enable to remove the root causes of maintenance delays as well as operational mishaps. This data-driven approach is based on a "Get Real, Get Better" approach, demanding rigorous self-assessment, strong characterization of current performance, and detailed analysis backed by accountability and the opportunity to implement needed improvements.

We appreciate the Committee's interest in ensuring our Naval forces have the right facilities to train, fight, and win, even as various demands on the land, sea, and air reduce the available area for military training. Specifically, we are grateful for the Committee's continued attention to the urgent need to expand the Fallon Training Range Complex, which is necessary to the readiness of every Naval Aviator and Navy SEAL. We are listening to the interests of Tribal governments, environmental organizations, and the local community, as well as our counterparts across the Federal Government, and are committed to finding a favorable solution for everyone involved.

Combat Climate Change

The United States Navy and Marine Corps recognize the reality of global climate change, our responsibility to mitigate our contribution to it, and our need to prepare for its short and long term effects. As we grapple with the effects of climate change on maritime operations around the globe, the DON must continue to lead and find ways to go farther, both in substantially reducing our impact on climate change and building a force that is resilient to its potential effects.

We must adapt our infrastructure for the coming changes with initiative and problem solving throughout the DON. In the past few months I have visited and recognized several Marine Corps and Navy installations that have demonstrated leadership in climate resiliency, environmental stewardship, and sustainable development. These facilities include Parris Island, Naval Base San Diego, Marine Corps Air Base Camp Pendleton, and Naval Base Point Loma. We will continue to invest in vehicles, infrastructure, and technology that increase our resiliency and efficiency, as we pursue the use and availability of alternative fuels. The DON is determined to lead from the front against the threat of climate change.

TAKE CARE OF OUR PEOPLE

The greatest source of readiness and strength for our force will always be the people who wear the uniform and comprise our civilian workforce, as well as the families that serve alongside them. We are committed to ensuring our Sailors, Marines, and Civilians are trained and equipped to execute the mission and return home safely, and that their families are provided with the housing, medical attention, and education they deserve.

Building the Future Force

To maintain a Fleet prepared to fight and win in long term strategic competition, we continue to evaluate and improve our capability to attract, retain, and develop a talented and diverse workforce. In the context of an intense competition for talent in our country, and in light of the rapidly evolving tactical and technical landscape, we are modernizing and enhancing our entire talent management approach to succeed.

We are continuously identifying opportunities for personnel to develop their leadership skills throughout the ranks, promoting equal opportunity in every aspect of our force. The DON is investing in the training, education, and professional development of our officers, enlisted personnel, and civilian teammates with special emphasis on partnerships with civilian institutions to enhance educational opportunities for our junior Sailors and Marines.

Eliminate Toxic Behaviors

It is a personal priority for all three of us to build a climate of trust, respect and inclusion throughout our force. A major focus of that effort must be on recognizing and stopping destructive behaviors early and consistently, so leaders at every level can take appropriate and effective actions.

We remain determined to eliminate sexual assault, sexual harassment, and gender discrimination from every part of our force. These behaviors are a betrayal of those who have stepped forward to serve in uniform. We will continue to work with this Committee to share best practices and ideas, relentlessly pursuing a future where no Sailor, Marine, or civilian teammate ever has to fear for their own safety while protecting us all.

To assist leaders in this effort, we have developed The Watch List: Top Five Signals of Risk for Sexual Assault, a research-driven tool that used Navy and Marine Corps data to identify five of the key destructive behaviors that increase risk for sexual assault. These include sexual harassment, gender discrimination, lack of responsibility and intervention, lack of respect and cohesion, and workplace hostility behaviors. We have promulgated The Watch List throughout the Navy and Marine Corps and are actively working to develop tools that will provide operational commanders data on their units so they can take action to prevent incidents.

We are actively engaged in rooting out extremism throughout our force. In coordination with efforts across the joint force, the DON has conducted “Extremism Stand Downs” at every echelon. This process sparked important conversations and made the position of our leadership and force clear to every Sailor, Marine, and Civilian in the DON, and we will continue to build on these efforts.

Trust is at the heart of all our warriors do. Extremist ideologies are a strategic threat to that trust and have no place within the Navy and Marine Corps. We will persistently focus on this problem, and appreciate this Committee’s partnership and involvement in this critical effort.

As leaders we must do all in our power to ensure that our people feel respected and valued. We cannot and will not tolerate discrimination or racism of any kind. Our core values and oath demand that we critically examine all of our policies and practices to remove inequity and unconscious bias.

Promote Mental Health

Mental health is a critical aspect of our readiness as a force—and our responsibility to our warriors and their families. We have made it a priority to ensure the ready availability of mental health professionals, chaplains, family counselors and other support professionals when our people are in need—or when they see the need in others.

I know from personal experience how helpful counseling can be during both personal and professional struggles. That’s why as part of our recognition of May as Mental Health Awareness Month, I launched a series of videos encouraging leaders throughout the DON to share their personal stories of seeking and receiving counseling and help. I also emphasized this point to our newest officers at the US Naval Academy Commissioning Ceremony, and will continue promoting mental health care throughout the force. We have to remove the stigma and start the conversation, particularly as our warriors and their families contend with the added stressors related to COVID-19.

The DON is committed to ensuring the health, safety, and well-being for all members within our military community. The loss of any Sailor, Marine or civilian to suicide is one too many. The DON offers a variety of suicide prevention efforts, encouraging positive help-seeking behaviors, eliminating stigma, and increasing visibility and access to critical resources. We are constantly revisiting and revising the portfolio to meet the needs of our people, and have increased our investment in this area.

Take Care of Our People

We are reforming operating procedures and promotion practices to reward initiative, applied problem solving, and innovative thinking at every level. A top priority as we evaluate personnel practices are the needs and challenges of military families, particularly dual service families. Senior leaders are also taking a personal and hands-on approach to ensure enduring excellence in housing, dependent education, and other quality of life concerns for our military families.

Through a combination of non-monetary, quality of life, and customer service programs, we are increasing our responsiveness to the needs of the individual warfighters and their families, making continued service a viable and attractive option. We are expanding opportunities for civilians with prior service through the Targeted Reentry Program. We are also expanding avenues for personnel to learn,

operate, and innovate with partners from the private sector, across the joint force, and alongside our allies.

Defeat COVID-19

With consistent personal and fleet discipline and continued refinement of best practices, we have ensured a robust, proactive, and coordinated COVID-19 response across the DON. We are preventing and containing outbreaks with minimal impact on fleet readiness, and are doing everything in our power to get the vaccine out to our Sailors, Marines and Civilians as quickly and effectively as possible.

The DON is also working with the Federal Emergency Management Agency to assist local, state, and tribal governments in the overall vaccination effort of the Nation, building on the proactive contributions to the urgent medical and security needs of the American civilian population, including the deployment of COMFORT and MERCY to our Nation's two most populous cities, and the deployment of medical personnel to facilities in communities across the country.

Like all Americans, the Navy and Marine Corps have adjusted to this global pandemic, from addressing outbreaks aboard ships, to changes in recruitment and training, to supporting our military families through extended deployments and virtual leaning. We have invested significant resources to upgrade the Navy and Marine Corps intranet to improve functionality and to enable telework for our military and civilian workforce.

The Navy and Marine Corps continue to operate under Force Health Protection measures to protect Marines, Sailors, civilians, contractors, and our military families. Across the DON, we've implemented flexibilities to help minimize risk to military personnel and their families, respond to evolving situations, and ensure the readiness of our force. We continue to use active testing protocols to detect asymptomatic COVID-19 positive personnel, contain outbreaks aboard vessels, and conduct surveillance to detect and treat the disease as early as possible.

We will not relent in these critical measures. We are well positioned to emerge stronger than ever, as the pandemic has forced us to rethink and refine our recruitment, training, and personnel movements across the DON, as well as our shipyard operations, deployments, and maintenance schedules, with efficiencies and applications of technology that can continue to benefit our operations and throughput long after COVID-19 is in our wake.

SUCCEED THROUGH TEAMWORK

A dominant naval force is central to the effective execution of our strategic goals. We must be ready at all times to execute as one integrated naval force—Navy and Marine Corps seamlessly linked at every level—with common logistics, infrastructure, practices and support networks—executing a fleet-wide emphasis on resilient and combat ready forces. These integrated connections must extend beyond the DON as well, encompassing our vital partners across the joint force and the whole of government, as well as our industry partners, shipyards, and allies and partners around the world.

Trust and Collaboration

Leaders throughout the DON are actively engaged with the joint force and the whole of government to meet the maritime challenges that face our nation. One key initiative of this collaboration is the Tri-Service Maritime Strategy, Advantage at Sea. This is a truly collaborative maritime strategic planning effort led jointly by all three of our Nation's sea services—Navy, Marine Corps, and Coast Guard. In order to execute these goals, Admiral Gilday, General Berger, Admiral Schultz and I are working together in order to promote integration, communication, and collaboration as a warfighting priority. There can be no daylight between us as we strengthen the integrated all-domain Naval power of the United States.

Operationalizing the Audit

In my previous roles as Assistant Secretary of the Navy for Financial Management and Comptroller, and while Performing the Duties of Comptroller for the Department of Defense, I saw first-hand the importance of effective, transparent examination and oversight, and I witnessed the direct relationship of accountable financial controls to our frontline strength. In my current role as Acting Secretary of the Navy, I am determined to strengthen this process in order to provide our Congressional oversight partners with complete visibility and accountability for every dime.

Central to this effort is building on the findings of our financial statement audit process, and improving that process moving forward. As I've emphasized to senior leaders across the Navy and Marine Corps, the audit is Commander's business. Ac-

curate inventory, proper resource allocation, redundancy elimination are all directly connected to our end strength.

We are on the right path towards obtaining an audit opinion for the Navy and Marine Corps general funds, and the DON working capital fund. We have a detailed roadmap that will guide our effort, placing a strong emphasis on budgetary reform, including receipt, distribution, execution, and monitoring.

PB22 increases investment in DON oversight functions. In addition to our work on the financial statement audit, we are looking at ways to increase effective oversight going forward, removing redundancy and duplication of effort in every part of our enterprise through the performance audit process. I have met with leaders across the government and the DOD to discuss audit planning and understand areas of high risk, and am incorporating that feedback into the FY22 audit priorities direction provided to the Naval Audit Service and our internal control program under the Federal Managers Financial Integrity Act and OMB Circular A-123. Our top priority is to ensure that our oversight capabilities and capacity is as efficient and effective as possible in order to keep our promise to the American taxpayer and the warriors on the frontline.

Sustaining Maritime Information Superiority

Leaders in every functional unit and discipline have been directed to set business systems modernization on an integrated path that is sufficiently resourced and supported across the DON. We are using data driven decision-making to achieve tangible savings while consistently working to become more effective and more efficient.

Modernization of our information technology infrastructure is a critical warfighting priority for the DON. Effective use and management of data is key to our digital transformation, and will change how we will fight and win at every level. We are consolidating legacy systems and will have moved from ten financial systems to three by the end of this fiscal year. I have established top-down performance management efforts, driven by data, to ensure the cyber resilience and strength of our defense business and warfighting networks.

As an information age naval force, every DON warfighting function and mission area is dependent on data and information to rapidly inform decision-making throughout the entire competition to conflict continuum. The dependency on secure and reliable IT has grown exponentially over the last decade and is critical to maintaining a competitive warfighting advantage. Simply put, information is combat power.

In order to generate and sustain that power, the DON is building on the findings of our Cybersecurity Readiness Review with an Information Superiority Vision, detailing how the Navy and Marine Corps will:

- Modernize our infrastructure to bring the DON to parity with industry, move data and information from anywhere to anywhere securely.
- Innovate and leverage emerging technology including 5G and Artificial Intelligence to drive capability outcomes for competitive advantage at speed.
- Defend forward with robust information protection regardless of where data resides.

Through Operation FLANK SPEED, the DON is shifting enterprise collaboration and productivity services to an enduring cloud-based Microsoft Office 365 solution which will provide world-class security and collaboration tools to improve productivity across our distributed workforce.

This initiative will modernize our infrastructure to a more cloud-enabled, performant, and defensible network allowing data and information to move from anywhere to anywhere securely. It will also improve our overall cyber readiness posture by implementing key Zero-Trust-Architecture principles; securing devices and endpoints, establishing identity and user privileges, and introducing content and data rights management.

The Marine Corps has now completed the transition of all users to Microsoft Office 365, and I have directed the transition of over 470,000 users in the Navy no later than December 31, 2021. Flank Speed will create the capabilities needed to increase Naval lethality and our ability to fight and win.

Failure to invest now will result in this effort now would further delay much needed improvements to our core technology infrastructure and leave the workforce without a sustained follow-on capability once the DOD-provided Commercial Virtual Remote capability is sunset in June 2021, extending our reliance on outdated, duplicative and less secure legacy IT systems that cost more and deliver less, further eroding DON's competitive warfighting advantage.

Strengthen Relationships with Stakeholders

Working alongside our vital industry partners, we are aligning our efforts to produce the right platforms and capabilities for the warfighter, and ensure maximum availability and throughput from design to production to maintenance.

We're working closely with our partners and suppliers in the defense industrial base to ensure the continued viability of the crucial businesses and infrastructure needed to ensure our ships, aircraft, and ground equipment are available when needed for the defense of our nation, both during the current COVID-19 challenge and long into the future. A robust, resilient, and nimble industrial base and supply chain is critical to the long term strength of our Navy and Marine Corps. Funding predictability and long term planning are key elements in ensuring the efficiency of our acquisitions and maintenance processes in partnership with a supply chain calibrated to deliver maximum value to the taxpayer and warfighter.

At our public shipyards, the DON took aggressive steps at the start of the COVID-19 pandemic to implement and require safety measures to protect the personnel, civilians, contractors, and families. These steps have included maximum telework opportunities for shipyard employees, administrative leave for high-risk individuals unable to telework, altered shifts to maximize social distancing, sanitization and hand-washing stations throughout the shipyard, cloth face coverings and face shields for the workforce, and screening checks at all workplace entry points.

Global Engagement

We cannot meet the global challenges our Nation faces alone. Readiness requires presence and rapid capabilities in every part of the world, as well as specialized and localized knowledge to handle evolving and challenging situations. The strategic maritime defense partnerships we maintain today with our partners and allies extend the reach and power of our force. They underscore the importance of cooperation and coordination in maintaining the rules-based international order that enables so much of our global prosperity and security.

Our personnel regularly train and operate alongside their foreign counterparts, test the interoperability of our systems, and build our collective readiness on the front lines of great power competition. Operational exercises, international port calls, joint Marine force training, and other interactions generate the personal contact that builds understanding, respect, and trust across national and functional lines. Our Sailors, Marines and civilian personnel know that through their service they are front-line diplomats for our nation. Their professionalism and dedication promotes the connections that strengthen our collective security and cultivate shared ideals that send the message that the United States is a friend worth having.

CONCLUSION

Our Sailors, Marines, and civilian teammates will always be our greatest source of strength in a challenging and changing world. On behalf of each of these brave patriots and the families that serve at their side, I once again thank the leadership and membership of this Committee for your attention, interest, and ongoing commitment to the defense of the United States of America. It is an honor to work with each of you, and I look forward to your questions.

Senator TESTER. Secretary Harker, thank you for your statement. Now we will go to Admiral Gilday.

STATEMENT OF ADMIRAL MICHAEL GILDAY, CHIEF OF NAVAL OPERATIONS, UNITED STATES NAVY

Admiral GILDAY. Chairman Tester, Vice Chairman Shelby, distinguished members of the committee, thank you for the opportunity to testify today along with Secretary Harker and General Berger. I am thankful for the enduring support that this subcommittee provides the United States Navy.

I believe that this hearing comes at a critical time in our Country. The competition at sea is intensifying. China and Russia are rapidly mobilizing their militaries. They are attempting to undermine our alliances and degrade the free and open order.

The Chinese battle force is the largest in the world, and it is growing. Backed by a robust industrial base and the biggest ship-

building infrastructure in the world, they command a modern fleet of surface combatants, submarines, aircraft carriers, amphibious assault ships, and next-generation fighters.

Furthermore, they are strengthening their space capabilities and stockpiling an arsenal of long-range missiles to hold us and our allies and partners at risk.

China is deliberately modernizing for the twenty-first century, building all domain capabilities that rival our own. Make no mistake. Our fleet, your fleet, can control the seas in conflict and project power is sure today, but we will be increasingly challenged to do so in the future, unless difficult choices continue to be made.

The results of analysis over the past 5 years inside and outside the Pentagon have been consistent, and they have been clear. America needs a larger, more capable fleet. Importantly, our latest study gave us the headlights not only for the size, but also for the composition of that force.

We need to transition away from older, less capable platforms and deliver the platforms, weapons, and systems that provide overmatch. At the same time, I think that we need to grow. However, the Navy currently faces a task of recapitalizing our strategic nuclear deterrent, something we have not done in four decades, making a once-in-a-century investment in our public shipyards and preserving the current readiness so that our fleet can confidently operate forward and be relevant.

Nearly 70 percent of the ships that we have today we will have a decade from now. We have to take care of the ships that we own, but the price tag on that readiness is rising. Over the last 20 years, manpower operations and maintenance costs, which make up over 60 percent of our budget, have grown at a rate 2.4 percent above inflation.

Meanwhile, our buying power is less than it was in 2010. Back then, we had 288 ships. Today, we have 296. Given these factors, if the Navy's topline remains flat or goes down, the size of our fleet will shrink.

Nevertheless, we are determined to deliver the most ready, the most capable, and the most lethal Navy we can with the budget that we are given. To do this, we are improving maintenance in our shipyards and aviation depots.

We are ensuring our ships are properly manned, our magazines are filled with ammunition, spare parts are in our storerooms, and our sailors are getting their steaming days and the flying hours they need to hone their skills.

We are working hard on a more robust, resilient network infrastructure as part of JADC2 (Joint All Domain Command and Control).

We are investing in long-range precision firers, like hypersonics and tactical Tomahawk, and we are developing directed energy systems, lasers, to improve fleet survivability.

Our eye is on the larger, hybrid fleet. We are determined to build affordable capacity, including a deliberate approach to uncrude vessels.

And, we are making sure every sailor can outthink and outfight any adversary by scaling our twenty-first century training frame-

work, Ready Relevant Learning, as well as our investment in live, virtual constructive training.

Senators, the average age of the Chinese fleet is 11 years. Ours is 21. It is time to move decisively and build a future Navy. We must modernize now, in this decade, or risk falling behind while we maintain a forward posture that keeps America safe and prosperous.

I am extremely proud of our sailors, our Navy civilians, and our families, who have endured sustained, historic high optempo in the midst of this pandemic. They are the source of our strength, as are the patriots in our shipyards and our aircraft depots, and our partners in industry, companies large and small, who keep the production lines moving.

Again, I am grateful for this subcommittee's support to our Navy and Marine Corps team, and I look forward to answering your questions. Thank you.

[The statement follows:]

PREPARED STATEMENT OF ADMIRAL MICHAEL M. GILDAY

Chairman Tester, Vice Chairman Shelby, distinguished members of the Committee, thank you for the opportunity to testify today on the posture of the United States Navy. Moreover, on behalf of all our Sailors, Navy civilians, and their families, thank you for your continued leadership and support. With the funding provided by Congress these last several years, we are building back our readiness, strengthening our advantages at sea, and keeping our fleet deployed forward where it matters.

This hearing comes at a critical time for our country. Multiple nations are working to undermine the free and open rules-based international system that has benefited so many for so long. Our rivals are rapidly modernizing their militaries to erode our advantages. The COVID-19 pandemic threatens the health and livelihood of our people. Climate change puts our coast lines at risk with rising seas levels and more severe weather. And the maritime environment—a vital source of our nation's prosperity and protection—has become increasingly contested. America's Navy is ready to meet these challenges. As we have done since our founding, we will set sail to defend our Nation, take care of our people, and succeed through teamwork.

The President has made it clear—America stands at an inflection point. The choices we make today will have a dramatic impact on the future of our nation. The very nature of the free and open international system is threatened. To defend our nation, safeguard economic opportunity, and secure the blessings of liberty for years to come, we must renew our enduring advantages and work in concert with our allies and partners to secure the rules-based order at sea.

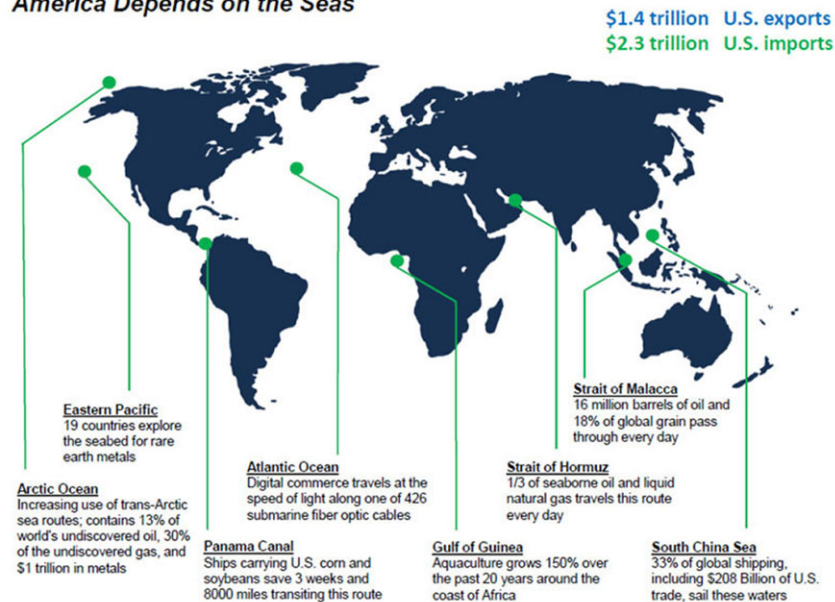
AMERICA IS A MARITIME NATION—OUR PEOPLE DEPEND ON THE FREEDOM OF THE SEAS

The United States Navy—alongside the Marine Corps and Coast Guard—provides a unique, enduring advantage to the American people. Since our nation was founded, Americans have relied on the seas for prosperity and protection. For 245 years, our Navy has deployed forward to ensure safe passage for our commerce and to keep fights far from our shores. Since the end of World War II, we have sailed with like-minded navies to build and sustain the open, rules-based international system at sea. Together, we have provided stability, deterred great power war, and ushered in prosperity for billions across the world.

Over time, our reliance on the seas has only grown. Today, 90 percent of global trade by volume travels by sea, facilitating \$3.7 trillion in U.S. commerce annually and supporting 31 million American jobs. 95 percent of global internet traffic travels along undersea cables, fueling our digital economy and accounting for \$10 trillion of financial transactions every day. The free flow of commerce—both physical and digital—cannot be taken for granted. It relies on the rules-based international system at sea and unimpeded access to markets through open waterways. Even minor disruptions can have extraordinary impacts. The recent grounding of the container ship *Ever Given* in the Suez Canal, which delayed hundreds of ships and cost the global economy an estimated \$9.6 billion per day, highlights the importance of predictable passage through the world's strategic waterways. If a rival nation attempted to control passage through the South China Sea—a strategic location where

\$208 billion of U.S. commerce flows annually—the impact to the global economy would be extremely costly.

America Depends on the Seas



Meanwhile, the competition for offshore resources such as aquaculture, energy, and rare-earth minerals is increasing across the globe. Currently, 93 percent of the world's fishing stocks are overexploited, threatening a major protein source for 3.3 billion people. Several nations have deployed distant water fishing fleets and expanded the use of maritime militias in their quest to maintain their lucrative fishing industries. Additionally, many nations are increasingly looking to maritime sources of energy and mineral wealth. The global oil and gas industry, which generates an estimated \$3.3 trillion in annual revenue, is turning toward energy exploration along the seafloor to extract untapped reserves. With trillions of dollars in raw resources awaiting discovery on the unmapped ocean floor, states and multinational companies are racing to develop capabilities for deep-sea mining.

The world's oceans have always been a wellspring of wealth and prosperity. Today, and in the years ahead, they pose an increased risk of competition turning into conflict.

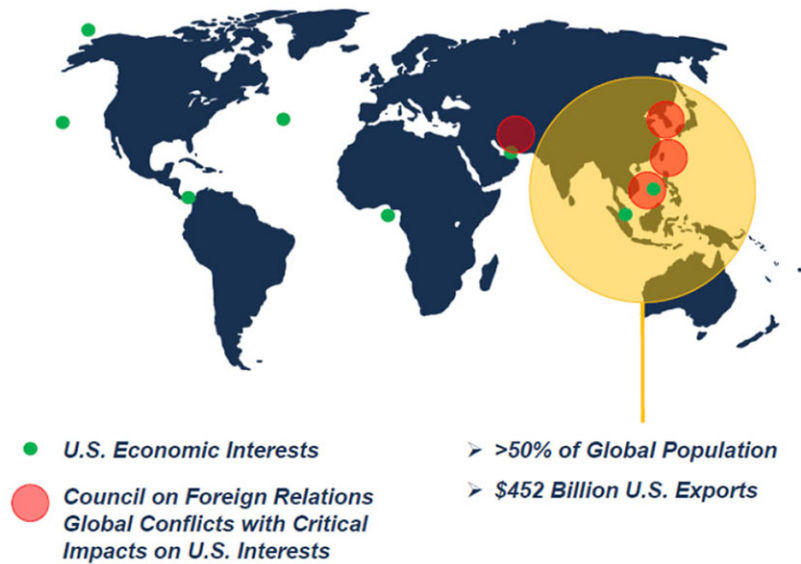
THE GROWING CHALLENGE TO THE UNITED STATES AND THE OPEN INTERNATIONAL SYSTEM

Despite benefiting from free and open seas for decades, the People's Republic of China (PRC) and Russia are currently working to undermine the rules-based international system at sea. Both are attempting to control access to key waters and the resources that lie within these waters, inhibiting freedom of the seas and overflight. Both are intimidating their neighbors and attempting to enforce unlawful claims with the threat of force. Both are expanding sophisticated networks of sensors and long-range weapons to hold important waterways at risk. Both are leveraging offensive cyber tactics to advance their competitive advantage, illegitimately obtaining U.S. intellectual property to close research and development gaps and disrupt our industrial base. And both are attempting to replace the free and open international system with a more unilateral and self-serving one by turning incremental gains from their malign actions into long-term advantages—such as militarizing contested features in the South China Sea or illegally annexing the Crimean peninsula.

The PRC's and Russia's revisionist approaches at sea threaten U.S. interests, undermine alliances and partnerships, and degrade the free and open international order. Moreover, the PRC's and Russia's aggressive naval growth and modernization are eroding U.S. military advantages. Unchecked, these trends will leave the Navy

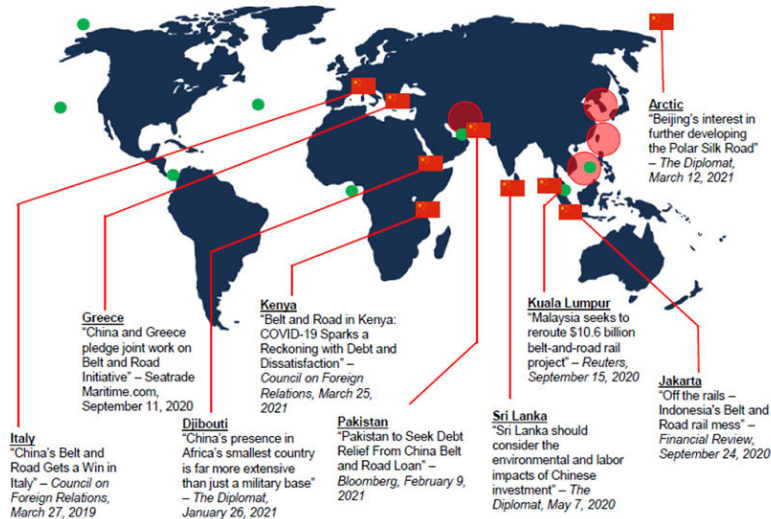
unprepared to ensure our advantage at sea and protect national interests within the next decade.

Hotspots That Threaten Critical U.S. Interests



The PRC—our pacing challenge—is carrying out a strategy aimed at the heart of America’s maritime power. They are deliberately working to erode maritime governance, inhibit freedom of the seas and overflight, deter our engagement in regional disputes, and displace the United States as the partner of choice across the world. To achieve its strategic goals, the PRC has rapidly grown its Navy from 262 to 350 ships. Today, their fleet includes modern surface combatants, submarines, aircraft carriers, amphibious assault ships, and polar icebreakers. Expanding their robust naval force with a hundreds of Coast Guard and maritime militia vessels, they routinely harass neighbors to exert pressure at a level below traditional armed conflict. They have built the world’s largest missile force to target regional waters in an attempt to intimidate others. They have strengthened all dimensions of military power to contest the United States from the seafloor to space and in the information domain. Under the One Belt, One Road Initiative, they are extending their maritime infrastructure across the globe through aggressive investments, particularly in ports, to control access to critical waterways.

China's One Belt, One Road: Maritime Expansion

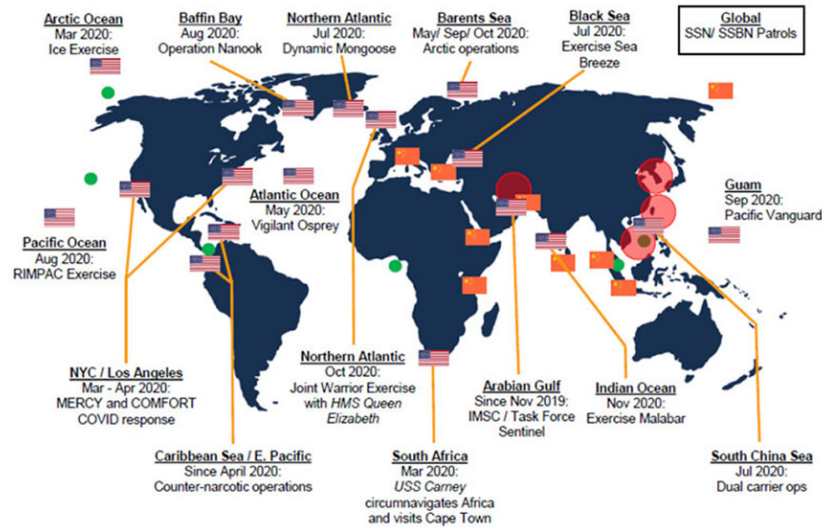


As our U.S. Indo-Pacific Commander recently stated, the greatest danger for America and our allies is the erosion of our conventional deterrent with respect to the PRC. Absent a convincing conventional deterrent, the PRC will continue to take action to undermine the free and open conditions at sea upon which our citizens rely. While the PRC is expanding its influence across the globe, this challenge is most acutely present in the Indo-Pacific, including the East and South China Seas and increasingly in the Indian Ocean. History shows that a strong U.S. Navy provides a stabilizing influence across the world, assists in peaceful maritime dispute resolution, and expands economic opportunities for the American people. The future will prove no different.

U.S. NAVY—DEPLOYED FORWARD TO DEFEND AMERICA AND OUR ALLIES AND PROTECT THE FREEDOM OF THE SEAS

The U.S. Navy is responding to the challenges to our free and open international system by demonstrating our global reach, enforcing common principles, sustaining the conditions that enable shared prosperity, strengthening our alliances and partnerships, and modernizing our fleet to control the seas in conflict and project power in contested environments. Today, over 42,000 Sailors are deployed on 111 ships and submarines to preserve freedom of the seas, deter conflict, and keep America and our allies safe. Together with the Marine Corps and Coast Guard, our Navy is delivering integrated all-domain naval power across the globe. And we are doing this in the midst of a global pandemic.

The U.S. Navy Deployed Around the World



Even with many parts of the world shut down in response to COVID-19, the worldwide demand for naval forces required us to maintain a high operational tempo, which included eight major Carrier Strike Group and Expeditionary Strike Group deployments in FY-20. Since I appeared before you last year, the Navy has continued to steam and fly from the Arctic Circle to the Cape of Good Hope and from the Caribbean to the South China Sea. Our hospital ships provided relief to American communities; we executed underway training events for deployment certification; and we conducted exercises as part of the Joint Force and alongside our allies and partners. Our ability to sustain a forward posture rests on the individual commitments of over 600,000 Sailors and Navy civilians and their families. Their adaptive spirit and commitment to COVID-19 protocols kept the force healthy and our ships at sea.

The pandemic taught us a great deal about operating in a challenging environment. Our entire force learned how to adapt as we iterated and honed our COVID-19 Standardized Operational Guidance. Our logistics teams learned what it means to sustain our fleet with limited means. Our information technology workforce quickly scaled virtual private network licenses and supported the roll-out of virtual and remote environments to keep us connected. Our dedicated, patriotic shipyard and aviation depot workforce adapted to our COVID-19 protocols, came to work, and got our ships and aircraft back to sea. And we learned how brittle portions of our defense industrial base could be if not postured appropriately. We took every opportunity to learn throughout this dynamic year—and shared those lessons with our allies and partners—to improve the resiliency of our Navy in the years ahead.

We certainly did not address the challenges of continued maritime operations during this pandemic alone. Our broader Navy team—which includes Congress, industry, research institutions and laboratories, and our international allies and partners—overcame so much to design, build, and sustain our fleet through this pandemic. We cannot thank all of you enough. As our nation—and the world—emerges from this pandemic, we will continue to face the daunting challenge posed by long-term competition with the PRC and Russia. And we will need your support, now more than ever, as we modernize and recapitalize the Navy to sustain our enduring advantage at sea.

TIMELESS ROLES OF SEA CONTROL AND POWER PROJECTION

American security and prosperity is underpinned by the U.S. Navy's ability to control the seas and project power ashore in conflict. The world would be a less prosperous, more dangerous place if the seas were not open and free for the benefit of all. Every day, combat-credible naval forces operate forward to reassure our allies and partners, confront malign behavior, and deter potential adversaries from esca-

lating into conflict. We preserve a stable and secure global maritime environment and advance prosperity through transit, trade, and the lawful pursuit of natural resources. Our ability to carry out these essential functions comes from our ability to credibly control the seas and project power ashore in conflict. These missions are timeless.

Controlling the seas protects friendly shipping, provides the Joint Force and our allies freedom to maneuver, and denies the use of the seas to our adversaries. In the past, sea control required us to fight our adversaries on, under, and above the sea. Now, in our digital age, it requires us to also fight in space, cyberspace, and across the electromagnetic spectrum. In short, modern sea control demands the all-domain power of our Navy and Joint Force.

America also needs a Navy that can influence events ashore. This starts with deterring nuclear attack against our nation with our ballistic missile submarines—the most survivable leg of the nuclear triad. Projecting power and influence from the seas is vital to deterring aggression and resolving crises on acceptable terms to the United States. Our Navy must field capabilities in all domains—employing information warfare, cyber capabilities, special operations, and a host of conventional weapons launched from on, under, and above the sea—to convince our rivals they have no viable means of achieving their objectives through force. Our sea control and power projection capabilities, alongside our strategic deterrent, provide America and our allies their surest guarantee of peace. If the Navy fails to deliver a fleet that can control the seas and project power, our nation will lack the conventional deterrent needed to protect America and our allies and expand economic opportunities for the American people.

While America's need for sea control and power projection capabilities has not changed over time, how we operate and what we operate with is changing. Emerging technologies have expanded modern fights at sea into all domains. Ubiquitous and persistent sensors, advanced battle networks, and long range weapons have made contested spaces more lethal. Advances in artificial intelligence have increased the importance of achieving decision superiority in combat. Additionally, autonomous systems have shown promise for an effective and affordable way for us to fight and win in contested spaces. These technologies offer clear advantages to the militaries that integrate them first. America cannot afford to fall behind.

Meanwhile, our fleet is adapting to operate in new ways. To preserve and promote the rules-based order, we are taking a more assertive posture in daily operations. We are challenging excessive maritime claims by sailing and flying wherever international law allows and expanding our decision advantage by persistently monitoring activities at sea to expose malign behavior that undermines the rules-based order. Our cyber teams are actively defending our networks and projecting power in the cyber domain to maintain a tactical advantage against our rivals. Furthermore, we are dynamically deploying our forces forward to deter our rivals from making incremental gains and to work alongside our allies and partners to keep the seas free and open.

Should deterrence fail, our Navy stands ready to confront aggression and decisively win a fight. Using concepts such as the Joint Warfighting Concept and Distributed Maritime Operations (DMO), we will mass sea- and shore-based fires from distributed forces. By maneuvering distributed forces across all domains, we will complicate adversary targeting, exploit uncertainty, and achieve surprise. Controlling the seas by constraining or destroying adversary fleets will enable freedom of movement at sea and power projection ashore. Working with the Joint Force and our allies and partners, Navy submarines, aircraft, and surface ships will launch massed volleys of networked weapons to overwhelm adversary defenses and compel a termination of conflict on favorable terms. Delivering an all-domain fleet that is capable of effectively executing these concepts is vital to maintaining a credible conventional deterrent with respect to the PRC and Russia.

DELIVERING ALL-DOMAIN NAVAL POWER

To deliver the all-domain naval power America needs, our Navy must evolve our capabilities and grow our capacity. The Navy—working in close collaboration with the Joint Force—has studied, identified, and prioritized the future capabilities we need to execute our evolving warfighting concepts and maintain a credible deterrent with respect to the PRC. The PRC has invested heavily in anti-access capabilities. In conflict, they will seek to contest all domains and hold our forces at risk with sophisticated networks of sensors and a large number of long-range, precision weapons. To effectively deter the PRC as part of the Joint Force, our fleet must be imbued with distributed weapons of increasing range and speed, more magazine depth,

more mobility, more stealth and deception, and more sustainability. This requires a deliberate adjustment to our naval force structure.

Based upon multiple rigorous, threat informed assessments conducted over the past five years—both inside and outside the Navy—it is my best military advice that America needs a larger Navy to counter the People's Liberation Army Navy (PLAN) that is growing in both capability and capacity. To fill critical Joint Force demands, the Navy requires greater numbers of submarines, smaller and more numerous surface combatants, more lethal offensive capabilities, a host of integrated unmanned platforms—under, on, and above the seas—and a modern strategic deterrent. We also need a robust network infrastructure to link our distributed forces together and resilient logistics to sustain them. In short, a balanced, hybrid fleet of manned and unmanned platforms is the most effective and affordable way to meet the security demands of our nation.

Analysis has also confirmed that numbers are not the only factor—the composition and combat effectiveness of our fleet matters more. Naval power is not a function of ship numbers alone, nor is it simply a result of the lethal systems employed from those ships. It comes from the concepts that shape how we fight and the means to maintain, train, and equip our forces to win in combat. And it fundamentally comes from developing Sailors—the true source of our naval power—who can outthink and outfight and adversary.

Within the scope of the President's FY-22 Budget request (PB-22), we are maximizing our Navy's contribution to the Joint Force. We are prioritizing a fleet that is ready for combat over a larger fleet that is not ready to fight. We are divesting of legacy assets that do not bring sufficient lethality to the fight and investing in next-generation platforms and systems that close critical Joint capability gaps. Meanwhile, we are prioritizing the training and education needed to prepare our Sailors to outthink and outfight any adversary. And we are using every dollar we can to sustainably grow the fleet. As we prepare our fleet for long-term competition with the PRC, we are focused on key objectives in the following areas—readiness, capabilities, capacity, and our Sailors.

Readiness

To sustain America's advantage at sea, we must deliver combat-ready forces to deter aggression and keep the seas free and open. Deploying battle-ready ships, submarines, and squadrons around the world—from the South China Sea to the Arctic—deters aggression, reaffirms our commitment to allies and partners, and keeps the seas open and free. Readiness underpins our forward-engaged posture and touches all elements of the Navy, from our shipyards and aviation depots to the steaming and flying hours our Sailors use to hone their skills. With nearly 70 percent of the fleet we will have in 2030 already in service today, affordably sustaining our ships and aircraft is vital to meeting future demands. This is why PB-22 places such an emphasis on critical components of our Navy's readiness.

Our force is in a higher state of readiness today than prior to 2017 with a healthier surge force, improved shipboard manning, better training for our crews, and improved parts availability. Increased funding, combined with cultural reforms throughout the fleet, have arrested the decline in our readiness and put us on a path to recovery. Still, we have much work to do.

Deploying combat-ready forces starts with taking expert care of our platforms. To this end, we are using data-driven reforms to improve maintenance processes, increase operational availability, and save taxpayer dollars. We have seen tremendous success with these methods in our aviation community. For years our F/A-18 aircraft were stuck at a 55 percent mission capable rate. At the time, we assumed only an increase in inputs—aircraft, manpower, or parts—could raise the number of ready jets available to our pilots. However, in FY-19 we shifted our focus to cultural reform and used the power of data-analytics to raise our F/A-18E/F mission capable rate to 80 percent—a rate we have continued to maintain throughout all of FY-20 and into FY-21. With higher numbers of aircraft available, our aircrew are more ready to fly and fight than at any point over the last decade.

We are now applying a similar approach to improving ship maintenance. On-time private shipyard surface ship availability completion rates rose from 37 percent in FY-19 to 67 percent in FY-20. Meanwhile, public shipyards reduced maintenance delay days by over 75 percent from FY-19 to FY-20. To generate these gains, we modified contracting strategies, increased dry dock capacity, and optimized facility and pier layouts. We improved planning and adjusted maintenance durations to better align workload with shipyard capacity. We also leveraged authorities provided by Congress, such as the three year "Other Procurement, Navy" pilot program, to increase flexibility and stabilize demand for our shipyard workforces.

Unfortunately, COVID-19 impacted our recent ship depot maintenance gains—as the need to protect our people caused delays in on-time completion of ship maintenance. Half of our maintenance availabilities in both public and private shipyards are trending late due to workforce capacity reductions. To mitigate further impacts in our private shipyards, we accelerated awards of contract options and improved the cash positions of the industrial base. For our public shipyards, we mobilized over 1,300 skilled Navy Reserve Sailors, increased overtime usage, and rebalanced future workloads to address these delays. These efforts have stemmed the disruption COVID-19 caused to our shipyard maintenance and will mitigate work spilling over into FY-22. We are methodically and safely returning to normal operating conditions. Though some delays will continue to persist until the shipyards return to full strength, the production workforce in both public and private shipyards is returning to pre-pandemic levels.

Sustaining our advantage at sea requires us to make targeted investments in critical infrastructure. This includes ensuring our worldwide constellation of bases are postured to sustain and support our fleet at sea. Of particular importance are critical elements of our national defense industrial base such as our public shipyards and aviation depots. Our Shipyard Infrastructure and Optimization Program (SIOP) provides a strategic roadmap for necessary investments in dry-docks, capital equipment, and optimizing the layout of these vital national assets. We have already broken ground on a perimeter floodwall at Norfolk Naval Shipyard, and are building a new lock system at Portsmouth Naval Shipyard with many more projects on the horizon. We are also recapitalizing our aviation depot infrastructure. Through our Naval Aviation Fleet Infrastructure Optimization Plan (FIOP), we are developing a 10-year Master Plan that provides our aviation depots the capacity to sustain and modernize our aircraft, engines, components, and support equipment. Meanwhile, we are also transforming our Navy enterprise shore network infrastructure into a secure, resilient digital platform.

Sustaining our advantage also requires us to master all-domain fleet operations. To credibly deter aggression, we must integrate the all-domain power of the Navy with the Joint Force and our allies and partners. This starts with providing our Sailors adequate ranges to train for the high-end fight. The speed and scale of a potential fight for control of the seas has changed. The size of our premier Carrier Air Wing and SEAL training center—the Fallon Range Training Complex (FRTC)—is no longer sufficient. Within existing capacity, our Sailors cannot sufficiently train with longer-range weapons or practice the tactics and techniques they will need to employ against a near-peer threat. We will continue to work with Congress, tribal leadership, local communities, and key stakeholders in the year ahead to modernize the FRTC and ensure our Sailors have the infrastructure they need to train to win in combat.

Mastering all-domain fleet operations also requires a rigorous learning campaign. We are conducting a series of fleet battle problems, wargames, and exercises to refine our concepts and capabilities. For example, we recently conducted our most complex exercise to date involving unmanned systems, which brought unmanned surface vessels and aircraft under the control of a *Zumwalt*-class destroyer—the *USS Michael Monsoor* (DDG-1001). This summer we will conduct Large Scale Exercise 2021—bringing together our fleets from across the globe to test out key components of our DMO concept. Overall, our campaign of experimentation and learning prepares our Sailors for high-end warfighting and drives updated joint concepts, fleet requirements, and future naval capabilities.

Sustaining our advantage at sea depends on developing, training, and fielding battle ready surface force crews. As of the end of 2020, we have fully implemented all 111 Comprehensive Review/Strategic Readiness Review recommendations. Over 1,700 junior officers have now graduated from our new Junior Officer of the Deck course with training aligned to International Maritime Organization's standards. We are broadening the use of instructor-led virtual reality training through the construction of two Mariner Skills Training Centers and the modernization of our Integrated Navigation Seamanship and Ship handling Trainers. With the support of Congress, we are investing in and employing meaningful reforms in how we man our surface fleet, train our crews, schedule and execute workups and deployments, and how we equip and maintain the surface force.

We will continue to invest in these key priorities and drive maximum efficiency from every dollar to deliver the naval power America needs. We are currently meeting operational demands while adapting to protect our Sailors and their families. But readiness recovery remains a long game and will require sustained funding over time to fully recover.

Capabilities

To sustain America's advantage at sea, we must deliver a more lethal and better connected fleet. The fight at sea is evolving rapidly. Emerging technologies have expanded into all domains and made contested spaces more lethal. Artificial intelligence and machine learning, autonomy, quantum computing, additive manufacturing, and new communications technologies are transforming the maritime environment. These changes emphasize the need for the Navy to develop sea control and power projection capabilities at speed and scale. That means more lethality, more survivability, better combat logistics, and a resilient network that connects command and control nodes, platforms, weapons, and sensors all together.

PB-22 prioritizes capabilities that amplify the fleet's ability to disperse and project synchronized lethal and non-lethal effects from multiple axes and in all domains. To achieve this vision, we are developing a Naval Operational Architecture (NOA) that integrates with Joint All-Domain Command and Control. The NOA is a collection of networks, infrastructure, data, and analytic tools that connects our distributed forces and provides decision advantage. Beyond recapitalization of our undersea nuclear deterrent, there is no higher development priority. We launched Task Force Overmatch this past October to align resources and expertise from across our force to field the NOA by the middle of this decade.

Developing longer-range, higher-speed weapons—such as hypersonic missiles—will give our warfighters the competitive advantage they need. Hypersonic missiles change the risk calculus for our rivals by providing a non-nuclear sea-based prompt, global strike capability. We are working in close partnership with the Army to deliver a truly-joint, conventional hypersonic weapon across land and sea-based platforms. We conducted a successful test of our common hypersonic glide body in March 2020, which keeps our Conventional Prompt Strike program on-track to field this game changing capability by the mid-to-late 2020s. PB-22 signals our strong support for developing this vital joint capability.

Our adversaries are attempting to deter us with massive numbers of sea- and shore-based missiles. To complicate their ability to understand the potential battlespace, we are investing in Counter-Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance, Reconnaissance, and Targeting systems. Our response also includes fielding an inexhaustible directed-energy system that accurately and reliably defeats anti-ship cruise missiles (ASCM). The High Energy Laser Counter ASCM Project is expediting the development of critical technologies to protect our ships from the cruise missile threat. At the same time, we are pursuing other directed energy initiatives in parallel—such as the 150 kilowatt class laser weapon system—to accelerate learning and fielding of this critical capability. The recent demonstration onboard *USS Portland* showed how we can disable an unmanned aerial vehicle using directed energy. We will continue to invest in laser technology and non-kinetic defensive systems to increase fleet survivability while maintaining free magazine space for our offensive weapons.

Our logistics enterprise and strategic sealift capacity are also vital to sustaining our advantage at sea and keeping the Joint Force operating forward. Accordingly, we are modernizing networks and communication and navigation systems of our Combat Logistics Force to best posture this aging fleet to operate in a contested environment. We are also investing in increased fuel distribution capacity as well as improvements in our expeditionary rearm capabilities and resuscitative care surgery systems. Specific to the Sealift Fleet, which provides inter-theater lift capability to the Joint Force, we have accelerated recapitalization, leveraging a “buy used” strategy to replace our least ready vessels, and invested in service life extension for the net effect of increased readiness. We are grateful for Congress's authorization to affordably revitalize our Sealift Fleet with used vessels. We are moving ahead with purchasing two used ships in 2021 and five used vessels in PB-22, signaling our continued support for this approach. We will continue to work with Congress to efficiently recapitalize this critical capability in the years ahead and request that Congress remove remaining obstacles to used ship procurement. Our longer-term plan is to construct new vessels to replace prepositioned vessels in the Maritime Prepositioning Force as those ships begin to reach expected service life at the end of this decade.

Pivoting toward the future and resourcing needed capabilities—especially in the Indo-Pacific region—requires tough choices. To invest in the next-generation capabilities we need to meet the challenge of near-peer competitors, we need to divest of our legacy capabilities that no longer bring sufficient lethality to the fight. We will work transparently with Congress to make these critical divestment decisions and free up resources to modernize the fleet.

Capacity

To sustain America's advantage at sea, we must field a larger, hybrid fleet that is designed for sea control and power projection. To provide a credible conventional deterrent in peace and win in war, we need to sustainably generate cost-effective platforms and mature unmanned systems. This transition will increase the capacity of the fleet, expand our ability to distribute our forces, and rebalance the fleet away from exquisite, manpower-intensive platforms and toward smaller, less-expensive ones. By growing a hybrid fleet—on, above, and below the seas—we will ensure our success across the continuum of day-to-day competition, crisis, and conflict.

As we design and build a larger, hybrid-fleet, our number one acquisition priority remains delivering the *Columbia*-class ballistic missile submarine on time. No mission is more important to our nation than providing a secure and reliable strategic nuclear deterrent. Our ballistic missile submarines are the most survivable portion of our nuclear triad and provide an assured response to any strategic nuclear attack on the United States. With our *Ohio*-class submarines nearing the end of their service life, we cannot afford to get behind in delivering on the *Columbia* program. The first submarine is starting construction this year with the second boat on-track for procurement in FY-24. We will continue to drive affordability, technology development, and integration efforts to ensure the program remains on schedule and our ballistic missile submarines remain on patrol in the decades ahead.

Meanwhile, our future fleet places a premium on expanding our undersea advantage. During conflict, sea control and sea denial from beneath the waves are among our Navy's core advantages—we cannot afford to yield any ground to our competitors. We are now planning to construct the tenth Block V *Virginia*-class submarine with a Virginia Payload Module (VPM). PB-22 underscores our sustained support for procuring two *Virginia*-class submarines per year. Sustainable production of the *Virginia*-class submarine, in addition to the development of a follow-on attack submarine program, is key to sustaining our undersea advantage in the years ahead.

As we shift our focus toward smaller platforms that can operate in a more dispersed manner, there is a clear need to rapidly incorporate unmanned systems into our fleet architecture. They expand our intelligence, surveillance, and reconnaissance advantage, add depth to our missile magazines, enhance fleet survivability, and provide more risk-worthy vessels to operate inside the weapons engagement zone of any adversary. In other words, they give our operational commanders flexible and effective options to maneuver within a contested environment. The Navy is taking a deliberate approach to developing unmanned systems through our Unmanned Campaign Framework. Our framework lays out an overarching vision on how we intend to produce tested and proven systems at scale, as well as develop the core technologies required to successfully integrate unmanned systems on, below, and above the sea. By the end of this decade, our Sailors must have a high degree of confidence and skill operating alongside proven unmanned platforms. The combined capability of manned and unmanned systems will provide our operational forces the advantage we need in a future fight.

Nuclear powered aircraft carriers are the most survivable and versatile airfields in the world. For decades to come, they will remain a cornerstone of the Navy's forward presence, sea control, and power projection capabilities. *USS Gerald R. Ford* (CVN 78) represents a generational leap in the aircraft carrier's capacity to project power. Over the past year, *Ford* has been underway, executing over 7,100 total launches and recoveries with the Electromagnetic Aircraft Launch System and Advanced Arresting Gear. Additionally, over 30,000 pounds of ordnance has been moved, loaded and expended by embarked F/A-18 aircraft using Advanced Weapons Elevators (AWEs). Seven of *Ford's* AWEs have completed certification and the remaining four are on track to certify by this summer. We expect *Ford* to be cleared for blue water operations later this year and ready for employment in 2022.

The striking power of our Carrier Air Wing is vital to controlling the seas and projecting power in a high-end fight, and the adaptability of the air wing keeps our carriers relevant for 50-plus years of life. The air wing of today is currently transforming with the addition of the F-35C, the E-2D Advanced Hawkeye, and the CMV-22B Osprey. PB-22 increases our F-35 inventory to get the fleet closer to a fourth generation and fifth generation fighter mix. Carrier Air Wing TWO—which includes the first operational F-35C squadron—is currently undergoing pre-deployment training and will deploy later this year. Meanwhile, we are rapidly developing the MQ-25 Stingray—the Air Wing's first unmanned platform—to extend the striking range of our fleet. And we are laying the groundwork for the highly networked air wing of the future—a 6th generation family of systems that leverages manned-unmanned teaming—which will deliver overwhelming firepower in contested spaces in the years ahead. Delivering a 6th generation family of systems is vital to keeping

pace with PRC fighter development and sustaining our advantage over the seas. America cannot afford to fall behind.

We are also going through a surface combatant reset on ship design and construction to provide the next enduring hull forms for small and large surface combatants. Our surface combatant inventory is aging with limited options for future upgrades. At the same time, our future fleet design places an emphasis on greater numbers of small surface combatants. The *Constellation*-class frigate is a versatile, multi-mission platform capable of supporting day-to-day operations and the high-end fight. We began cutting steel on *Constellation* this year, and we are excited to incorporate this ship into the fleet in 2026. Meanwhile, the future large surface combatant (DDG(X)) will bring the space, weight, and power needed to incorporate future capabilities for the high-end fight such as high power lasers, long-range strike, and sensor growth. Together, both ship classes will bring more lethality, more survivability, more endurance, and more self-sufficiency to the fleet.

We are not just building better ships—we are building ships better. The Navy is mindful of past shipbuilding efforts that did not perform to plan, which is why we are moving ahead in ways that deliberately reduce risk. Early and sustained industry involvement, robust land based testing, and focused design maturity are foundational to our shipbuilding approach. We appreciate the strong support from Congress in FY–21. Delivering ships on time, on budget, and within performance targets is our priority.

Sailors

To sustain America's advantage at sea, we must recruit, develop, and retain a seasoned team of naval warriors. The strength of our naval power depends on the strength of our Sailors—active and reserve, uniformed and civilian. In the long-term strategic competition we face today, every Sailor must be able to outthink and outfight any adversary. Our Navy must remain the best trained, finest educated, and most ready maritime force in the world. We recognize the strength we gain from a diverse force and our actively pursuing combat-minded Sailors with varied backgrounds, experiences, and thought to build up our readiness and resilience. As we take care of our Sailors, we will accelerate their development and harness their talents to keep America safe and prosperous.

As we modernize our fleet, we are modernizing our talent management systems to better recruit, train, retain, and support our Sailors. We achieved our accession goal of 39,600 new active duty Sailors in FY–20 to further improve afloat manning and filled operational billets to their highest point in six years. PB–22 makes a slight reduction in our end-strength with the divestment of legacy ships. However, the demand for a highly trained, diverse force has not abated. We are grateful to Congress for the generous pay raises and personnel reforms. The Navy is leveraging both—alongside our talent management initiatives—to better recruit and retain our incredibly talented force. Meanwhile, we continue to transform our MyNavyHR infrastructure to rapidly deliver services to our Sailors and families at a reduced cost. This includes the DOD-leading mobile applications that help with the challenge of military moves and finding childcare or housing and the MyNavy Career Centers which proved vital during the COVID–19 pandemic.

We are continuing to cultivate a culture of excellence across the fleet, which builds resilience and strengthens our Navy's enduring standards of professional competence and personal character. Over the past year, our culture of excellence campaign has strengthened the signature behaviors that define our service to prevent the occurrence of destructive behaviors—such as sexual harassment or discrimination. At the same time, we have maintained a resolute focus on preventing the scourge of sexual assault within our ranks. PB–22 increases our civilian Sexual Assault Prevention and Response workforce to provide greater support for our Sailors and drive down investigation timelines. Overall, we are providing more training, more tools, and more resources so every Sailor receives the support they need.

We are also actively building a workforce that represents the full diversity of America and the strength it brings. Task Force One Navy (TF1N) was launched last year to analyze and evaluate issues in our military that detract from Navy cohesiveness and readiness. The task force released their report in January 2021 and highlighted 56 recommendations that will elevate a culture of diversity, equity, and inclusion throughout the fleet. Respect and the promise of opportunity are core to our Navy, and we are committed to implementing TF1N reforms and ridding discrimination, sexism, and other forms of structural biases from our ranks.

Without a doubt, the vast majority of Sailors in the U.S. Navy serve every day with honor, character, and integrity. However, we cannot be under any illusions that extremist behaviors do not exist in our Navy. As directed by the Secretary of Defense, each command across the fleet conducted a stand down to address extre-

mism within our ranks. Racism, injustice, indignity, and disrespect keeps us from reaching our potential—an inclusive, respectful, professional fighting force that answers the Nation's call with unparalleled readiness and lethality. The stand down was only a starting point; this will be an ongoing fight. We are committed to eliminating extremist behavior and all of its corrosive effects on our fighting force.

The intellectual investments we make in each Sailor provide a key advantage over our rivals. To strengthen our advantage in this area, we are aligning the curriculum and research of the Navy's education enterprise to deliver warfighting advantage in our operations at sea and in how we design, deliver, and generate our forces. Additionally, the Naval Community College is on track to provide our Sailors opportunities for education in fields that strengthen the service. Maintaining educational relationships with our international partners through exchanges and scholarships remains a priority for us to deepen enduring relationships and broaden understanding between likeminded navies.

To ensure our Sailors are ready for any challenge on the horizon, we are scaling Ready Relevant Learning (RRL) and Live, Virtual, Constructive (LVC) training. RRL provides the right training, at the right time, in the right way for our Sailors. It replaces "one-and-done" classroom training events with career-long learning continuums through a mix of in-classroom instruction and modern training methods. LVC technology blends the intensity of underway operation with high-fidelity synthetic training, allowing our Sailors to master high-end tactics in secure and controllable conditions. Our force will always fall back to their baseline under the stress of combat—RRL and LVC will raise their baseline.

CONCLUSION

Let there be no doubt—America is a maritime nation. Our security and prosperity are inextricably linked to the seas. For 245 years—in both calm and rough waters—your Navy has stood the watch to protect our homeland, preserve the freedom of the seas, and defend our way of life. For generations, we have provided a bulwark against aggression and have underwritten the international order that led to an unprecedented era of peace and prosperity. Now that order is under threat.

As the President stated, we are at an inflection point. The PRC's rapid military growth and aggressive behavior at sea has put it on a trajectory that will challenge our maritime advantage in the years ahead. Our naval forces—and the American people—must maintain a clear-eyed resolve to compete, deter, and—if necessary—defeat our rivals, while accelerating the development of a larger and more lethal future fleet. We must do so while integrating more closely with the Marine Corps and Coast Guard to generate integrated all-domain naval Power. Only by working as a team and taking care of our people will we be able to defend the nation in the years ahead. We must move deliberately, but also with speed. Our actions this decade will shape the maritime balance of power for the rest of this century.

On behalf of more than 600,000 active and reserve Sailors and Navy Civilians, thank you for giving me the opportunity to testify today. I am grateful to this committee, and to all of your colleagues in Congress, for your steadfast commitment to the Navy. We look forward to sailing alongside you to sustain our advantage at sea.

Senator TESTER. Thank you, Admiral Gilday.

Next up, it is you, General Berger.

STATEMENT OF GENERAL DAVID H. BERGER, COMMANDANT, UNITED STATES MARINE CORPS

General BERGER. Chairman Tester, Ranking Member Shelby, and distinguished members of this committee, thank you for the opportunity to testify on the posture of your Marine Corps this morning, our priorities, and the resources required to fund it all.

Over the past 2 years, since becoming Commandant, I have come to better understand and appreciate the bipartisan support of this committee, which I think is critical to creating and sustaining the force we have today, but also the force we are going to need for the future. I realize there are competing national priorities you must wrestle with, and that is going to put pressure on Defense budgets. But, I am also confident that you appreciate the severity of the security environment today.

The global competition, which the Chairman and Ranking both mentioned, with China and Russia is accelerating. Your military is going to need more advanced capabilities to effectively compete, to reassure our allies and partners, and to deter war.

Force Design 2030 is the Marine Corps' answer to creating the cutting-edge capabilities that will better enable the fleet and the joint force to deter, to compete, and to respond with ready forces to any crisis anywhere on the globe.

We are roughly 2 years into our Force Design effort. And while I am encouraged by our progress, I am not satisfied by the pace of change. We must move faster. To accelerate our modernization, we, as a service, need to do a better job of explaining the details of Force Design 2030 to yourselves and to your staff, and that is my responsibility as your Commandant.

It is important that this committee understands that the capabilities we seek are not the stuff of science fiction. They are already programs of record based on proven technology. And, while we do not have sufficient time this morning to address the full scope of our Force Design effort, I do want to highlight three key capabilities.

First is long-range precision fires for sea denial and sea control. Over the past several years, we have proven that our existing HIMARS (High Mobility Artillery Rocket System) vehicles can hold naval vessels at risk with ground-based, anti-ship missiles. Through aggressive experimentation, we can—we have further enhanced that capability.

This year, we successfully launched a naval strike missile from a modified, unmanned, joint light tactical vehicle, hitting a target at sea underway. This system, which we call the Navy Marine Expeditionary Ship Interdiction System, or NMESIS, is exactly the type of capability that Combatant Commanders are calling for to enhance their deterrent posture.

Second is unmanned ISR (Intelligence, Surveillance, Reconnaissance). In 2020, we began a transition to a mixed capability of long-range ship and ground-based, unmanned aerial systems, to include the MQ-9 Reaper. The Reaper has a proven capability that will significantly expand our organic ISR and enable us to better support fleet and joint operations, including anti-submarine operations.

We have also initiated a partnership with industry to develop a future autonomous, long-range, unmanned surface vessel. That is going to significantly improve the reconnaissance capability of our Marine Expeditionary Units, or MEUs.

Third, we are investing in loitering munitions. These swarming aerial munitions, which employ automatic target recognition, have proven exceptionally lethal in recent global conflicts, most recently in Europe. Our own tests have also demonstrated this technology to be effective with five of five successful shots during testing.

We plan to equip our infantry and reconnaissance Marines with this loitering capability. Mounting those munitions on both ground vehicles and long-range unmanned surface vessels—the one I mentioned earlier—and we will make a final decision on vendors this year.

With that brief update in mind, a fair question I think might be to ask, How do you plan to pay for all these new capabilities and other force design investments? Recognizing today's budget environment, the Marine Corps has, for the past 2 years, and we will continue, pursuing a cost-neutral approach to force design. We will self-fund our modernization. To ensure the success of this approach, I will ask for your support in reducing the total procurement of some platforms, commensurate with the recent reductions in our end strength.

The fact is, today's Marine Corps is significantly smaller than it was a decade ago—about 24,000 Marines smaller. That means we will not need as many ground vehicles. We will not need as many aircraft as we thought we did when initial procurement decisions were made decades ago. It is just simple math.

With the reductions outlined in our force design report, I believe we will have sufficient resources to create the modern capabilities required for competition, deterrence, and crisis response without a further reduction in our end strength.

That approach, however, relies 100 percent on this committee's confidence in allowing the Marine Corps to retain and reallocate the internal resources we generate through end strength reductions, cutting legacy platforms, and right-sizing previously set programs of record for new capabilities, like the F-35, CH-53K, and the Joint Light Tactical Vehicle.

My promise to you as Commandant is to remain the very best steward of taxpayer dollars, and I ask for your continued support to ensure your Marines, which are the Nation's force in readiness, remain ready to respond to any crisis, anywhere in the world, today, and into the future.

Like the Acting Secretary mentioned, I welcome the opportunity to work with this committee, and I look forward to your questions, both in this hearing and in the weeks to come.

[The statement follows:]

PREPARED STATEMENT OF GENERAL DAVID H. BERGER

Chairman Tester, Vice Chairman Shelby, and distinguished members of this committee, thank you for this opportunity to present the annual report on the Marine Corps. More importantly, thank you for your continued support and leadership over this challenging year. I believe strongly that major change in existing force structure and ways of doing business are needed in this era of renewed great power competition. The strategic environment the Marine Corps and joint force operate in has changed, as has the domestic context as a result of the ongoing COVID-19 and related relief measures. We must therefore make appropriate adjustments to our investment plans to ensure a proper return on the taxpayers' investment. The promotion and sustainment of the Marine Corps that our nation and fleets will need in 2030 and beyond requires your continued active support.

Since testifying last year, our nation has engaged in a long overdue conversation on race and social justice sparked by several visible incidents of institutional racism, and perhaps more importantly—how to remedy the inequities of the present. As with all other Americans, I—and every other Marine—have acknowledged these challenges, and will continue to do our part to overcome them once and for all. While confronting issues of inequality, we have simultaneously endured the adverse consequences of the COVID-19 pandemic. Like millions of others, Marines and their families across the country and globe suffered the consequences of isolation, closure of our public schools, and increased childcare demands; and like those millions of other Americans, Marines made the necessary sacrifices to stop the spread. I am proud of every one of those Marines with their collective leadership and of their ability to rapidly adapt and lead by example.

Our nation witnessed a small but violent minority attempt to subvert the rule of law through an overt act of violent coercion on January 6, 2021. Like most every other American, I was shocked by this attack on our democracy. I was even more dismayed to learn that some of those engaged in that attack had previously served in the military—to include the United States Marine Corps. Thankfully, we as a nation and military have done as we always do—learned, endured, and grown stronger. We have and will continue to actively work to identify recruits and Marines who hold extremist views and we look forward to participating in the Secretary of Defense's new Countering Extremism Working Group to develop additional methods of keeping extremists from within our ranks.

Over the past year, I have continued to communicate my understanding of the future demands of naval expeditionary warfare and maritime gray zone competition. Related to the future of naval campaigns, I have articulated a case for change to reinforce and expand existing naval warfighting advantages and create future strategic advantages. It is abundantly clear that a future operating environment characterized by a maturing and proliferating precision strike regime will place heavy demands on our Nation's Naval Services. We are not yet organized, trained, equipped, or postured to meet those demands and support fleet operations. This is no longer a controversial assertion as it was when my predecessor first uttered it. The vast majority of defense professionals—including the Members of the bipartisan Future of Defense Task Force—perceive the same challenges I do in the emerging operating environment, as well as the urgent need for real innovation and rapid change in response. Although there is an ongoing, healthy debate about how and what we should change across the Armed Services, there are very few lining up to defend the status quo. We must continue to discuss these changes, but defense professionals have almost unanimously acknowledged that real change is required—and soon.

Though some things require substantial change, we should be clear to acknowledge those foundational tenets which remain as relevant and operationally suitable today as they have been over the previous 70 years. In 1952, Members of Congress noted the Marine Corps “can prevent the growth of potentially large conflagrations by prompt and vigorous action during their incipient stages. The nation's shock troops must be the most ready when the nation is least ready...to provide a balanced force-in-readiness for a naval campaign and, at the same time, a ground and air striking force ready to suppress or contain international disturbances short of large-scale war...” This role as the nation's force-in-readiness, prepared to create strategic advantage via its ability to be quickest to respond to either crisis or conflict, and prepared to both prevent and contain conflict below the threshold of traditional armed conflict remains as valid today as it was when first articulated.

PERSONNEL AND TALENT MANAGEMENT

None of our Force Design 2030 aspirations are possible without addressing the people within our ranks. As Secretary Austin highlighted, “our most critical asset...is our people.” I believe this is even more relevant within the Marine Corps. Marines are the heart and soul of the Corps. Almost all of your 225,000 Marines serve honorably every day, representing the very best of our country and your constituencies. No institution, however, is without flaws. As I noted last year, malignant individuals and small malignant subcultures continue to exist within your Marine Corps. In this era of profound ideological division within our nation, some individual Marines regrettably bring with them, or fall victim to while in service, misogynistic, racist, and homophobic/transphobic ideologies driven by hate, fear, and ignorance. While I have instituted even more rigorous policies than previously existed to ensure we identify such individuals during enlistment and accession screening, I remain committed to identifying and holding accountable any Marine unable to uphold our core values and to adhere to our unapologetically high standards. This is what you should expect from me, and you will get it.

Within the context of the larger national conversation on race, social justice, and equality, it became clear to me early in my Commandancy that there were symbols and behaviors within our Corps that challenged the cohesion and unity essential to military effectiveness. The Confederate Battle flag stood out as one such symbol. I am not a historian and do not take a position as to the true meaning of this ancient banner, but some in today's world have rallied around the colors of that defeated rebellion to foster division and hate. As a result, I prohibited its display aboard all Marine Corps installations beginning last spring. My primary responsibility is to prepare Marines to fight and win in combat, and we cannot tolerate artificial division driving wedges among your Marines—especially ones so easy to identify and remove. I will do everything within my authority to remove any obstacle preventing

equality and cohesion. Signs or symbols that support or endorse hatred, ignorance, or injustice have no place in our Corps.

While these acknowledgements of past prejudice are good first steps, we must do more than simply look over our shoulders at the past. We must acknowledge the real bias and obstacles in the system today. We must promote and retain the very best Marines; however, it is clear to me that a degree of structural racism and sexism exists within our current system. We must create a system of structural equality that ensures all Marines—of all backgrounds—are able to use their best talents to solve the problems we soon will face. The diversity of thought and actions each Marine brings will help us find more creative and innovative solutions to these future challenges. We must actively work to retain and grow this diversity of thought through a more diverse group of talented individuals, while at the same time protecting against extremism.

Over the past decade and in close coordination with Congress, we've prioritized the prevention of sexual harassment and sexual assault as well as dedicated tremendous effort into providing the appropriate response to these criminal acts. I am convinced of the linkage between sexual harassment and sexual assault, thus we will continue to make every effort to eliminate both from our ranks with your continued assistance. We have increased the number of Victim Legal Counselors dedicated to supporting sexual assault victims over the past 12 months. However, all of these efforts are dedicated to the response after a tragic event has occurred. We must do better at the prevention in order to stop sexual assault and sexual harassment before they occur. Although we conduct regular training aimed at preventing this from happening, we are still working to overcome unhealthy attitudes and behaviors recruits arrive with to Recruit Training. We must develop practices that identify those negative behaviors before they turn into heinous acts and prevent such behaviors from occurring in the first place.

Improving the capabilities and proficiencies of the individual Marine necessitates we must also have the very best senior leaders for those Marines. I am humbled to serve alongside the General Officers and Flag Officers within the Department of the Navy. But even one instance of misconduct or misbehavior within our General Officer ranks is too many. Over the past decade, the Marine Corps has selected several officers for promotion to brigadier general who subsequently failed to be confirmed by the Senate. This is unacceptable. Over the coming months, I will announce several major policy changes related to talent management to include how we screen and select our commanders and most senior leaders. We are currently reviewing the efficacy of implementing a 360-degree review for all lieutenant colonels and colonels eligible for command selection and all colonels eligible for selection to brigadier general, to help ensure we identify the absolute best who have earned the trust and respect of juniors, peers, and seniors alike. In addition to these issues related to screening, I remain concerned at the absence of Black officers within the senior ranks of our aviation enterprise and specifically within the ranks of our fixed-wing pilots, as well as the paucity of female general officers. We are currently studying both issues, and will share the results of those studies once completed.

As you are aware, we cannot create new senior leaders in a day. If we are to correct our gap in diversity at the senior ranks, we must also address diversity at accessions. The largest single source of commissioning within the Marine Corps is the U. S. Naval Academy, accounting for nearly 20% of officer commissions each year. A recently released study identified that almost 75% of the nominations to our service academies were given to white students. The diversity of this population has a direct impact on what leaders are available for selection to our senior ranks.

It is not enough that we recruit and train the very best. Once Marines have joined our ranks, we must nurture and incentivize them along their individual journeys through a modern talent management system flexible enough to account for changing career interests and common life choices over time. Without such a system, we will increasingly struggle to retain the very best people in an ever more competitive marketplace. Our one-size-fits-all, industrial-era approach that treats individuals as interchangeable cogs within a larger machine does not appropriately incentivize the most talented individuals to remain in service. We are currently reviewing policy options that will offer Marines greater flexibility when it comes to tour lengths based on an individual's circumstances—most notably when a Marine has a child entering or completing high school. Our Marines must not be forced to choose between being good parents or being good Marines. Those sterling goals must be compatible. I remain committed to improving the lives of our Marines as they become parents and we are looking into ways that would prevent them from having to choose between the newborn and continued service as a Marine. I truly desire a Marine Corps known for being the best within the joint force for our treatment of new parents and families—and not just our warfighting prowess.

It is a well-known issue that the Marine Corps is struggling to recruit and retain Americans possessing the crucial science, technology, engineering, and mathematical skills and competencies required for the future. Technology companies present exciting and challenging opportunities for software developers, cyber professionals, and engineers. We must offer opportunities that allow someone to choose both service and professional reward. In addition, we must do a better job targeting the application of our NROTC scholarships to these individuals, as well as explore new possibilities with Historically Black Colleges and Universities to satisfy these shortfalls.

The military services—including your Marine Corps—continue to lose the competition with the civilian airline industry for pilots and maintainers, even with the adverse impacts of COVID-19 on the airline industry. We are not maintaining sufficient numbers of naval aviators and F-35 maintainers to sustain either our existing inventory of aircraft or aircraft programmed for the years to come. Within our F-35 community, we have a shortfall of both pilots and maintainers. I am concerned that if we do not remedy these shortfalls in the very near future, we may be in a situation in which we are directed by Congress to procure aircraft for which we have insufficient pilots and maintainers.

TRAINING AND EDUCATION

A key element of our larger force design transformation is our need to adopt an information age approach to training and education that produces better leaders and warfighters more effectively and efficiently. The essence of this approach is to focus on identifying, developing, and sustaining the unique talents of individual Marines, not turning out MOS-shaped cogs to fit MOS-shaped slots in a machine. Better warfighters in an era of exponential change means adaptive, critical thinkers who are also tactical and operational masters of their profession.

Among many implications of this shift will be higher expectations and intellectual standards for Marines, especially commissioned officers, at every stage of their selection for and attendance at formal schools. We still need standardized training and education to set a baseline and inculcate our core Service values and ethos, but there are significant aspects of entry-level training that must be adapted. Much of our current understanding of future warfighting requirements, associated concepts, and force design point to a more highly trained force from the entry-level onward. We need to change how we train and educate as well. We have known for a long time that rote repetition and even “perfect practice” against static, unresisting targets is only the barest beginning of mastery. Consistent opportunities to make tactical and operational decisions against a thinking enemy must be a critical part of our curricula at all levels. This kind of force-on-force wargaming and training must stand on a solid foundation of military history and theory-games, simulations, and exercises are necessary, but not sufficient. We will develop that foundation in school, but sustain it by rigorous, accountable, self-directed effort. We must address the question of “standards” transparently and head-on to create the force we desire, and to create the force we advertise. In an initial step to creating a philosophy and culture of a learning organization, last year I signed the first all-new service doctrine since 1998; MCDP 7 Learning was released in February and MCDP 1-4 Competing in December. In addition to releasing new doctrine, we have elevated command of our Training and Education Command to a three-star general, equal to all other Deputy Commandants, and are in the process of re-establishing a robust Futures Directorate.

Achieving diversity of thought requires fixing our entry-level instruction to allow every new recruit and officer candidate the same opportunity to master these skills without it impeding their future career opportunities. Not every young man or woman who joins our ranks grew up participating in activities relevant to individual battlefield skills such as marksmanship, orienteering, water survival, or technical skills. As a matter of longstanding practice, however, we continue to assess potential at the very earliest stages of our recruit and officer training programs based on performance in precisely those skills. There is no doubt of the continuing importance of these military basics, but we cannot expect every new Marine to master those individual skills with the same amount of in-service instruction, regardless of previous experience. A new recruit who has never touched a rifle cannot be expected to master marksmanship in the same amount of time as a recruit who grew up handling rifles regularly, and a Marine who never learned to swim should not compete unaided for job placement with a Marine who grew up as a competitive swimmer. In effect, we penalize Marines who fail to master these basic skills because they did not start with the same knowledge or skill base. While holding the line on the standard of basic competencies that define a Marine, our entry-level training must

provide the instruction necessary for every recruit and officer candidate to achieve mastery in basic skills, regardless of how much time it takes.

The COVID-19 pandemic brought new challenges and opportunities to your Marine Corps. During the entire time, your force-in-readiness continued recruiting, training, operating, and deploying around the globe. Although we did not stop any of our activities, we did learn many lessons from the pandemic that we can continue to use going forward to make a more resilient and capable force. We devised new methods of virtually connecting with potential recruits and with our force, internally. For entry-level training, we spread out recruits while they slept and installed more handwashing stations, which has virtually eliminated the inevitable illness that the new recruits will pass around as they come in from all over the country. A key factor in this success has been the level of discipline instilled by small unit leaders which prevented any significant outbreaks and kept Marines healthy. Your Marines continue to serve their communities by establishing federal COVID-19 vaccine sites in local communities in support of the Federal Emergency Management Agency. As President Biden highlighted, we don't have enough people to provide vaccination shots—put the shots in people's arms—so Marines are filling in this immediate shortfall.

GENDER INTEGRATED TRAINING

The FY 2020 NDAA directed the Marine Corps to integrate training at both Marine Corps Recruit Depots Parris Island and San Diego. Since the signing of the law, we have trained multiple integrated companies at MCRD Parris Island. In February, the recruits of Lima Company were the first gender-integrated company at MCRD San Diego in the installation's 100-year existence. To train the first females at MCRD San Diego, we graduated the first gender-integrated class at Drill Instructor School in San Diego in December and relocated female drill instructors from MCRD Parris Island. We will take the lessons learned from this company as well as a concurrent study to identify the requirements needed to fulfill the 2020 NDAA within the prescribed timelines. However, as I have publicly stated several times, we will prioritize options that provide the best training and most efficient use of resources to ensure Marines graduating from boot camp are ready for the rigors of service in an elite organization during challenging times.

FORCE DESIGN

Shortly after I testified before this Committee in the spring of 2020, I published the Force Design 2030 report. Force Design 2030 is how your Marine Corps is changing its trajectory to create advantage for the fleets and joint force in both maritime gray zone competition and more traditional conflict. Although we need new capabilities to deter adversaries, we must fundamentally change how we think about armed conflict. We can no longer view warfare through the binary lens of war and peace, but should recognize the existence of a cyclical continuum of competition that occurs every day and involves all elements of national power. Historically, the military viewed maintaining the peace as deterring war through denial or by punishment. Force Design 2030 offers a third option in addition to those two that will counter strategies below the threshold of armed-conflict by winning the reconnaissance and counter-reconnaissance competition and facilitating deterrence by detection.

At its core, Force Design 2030 is a campaign of learning. Through wargames, analysis, and limited experimentation, it has become clear the joint force needs a capability that operates persistently and with maximum organic mobility and dispersion to compete and deter in the contact and blunt layers. The vulnerability of large fixed bases and shore-based infrastructure to long-range precision strike, combined with the impracticality of defending such infrastructure from the pacing threat's emerging capabilities at any politically-feasible level of resourcing and regional posture, necessitates that the stand-in force be able to perform these functions from a strictly expeditionary and highly mobile and resilient naval posture. This refined analysis and understanding is what is driving our Force Design 2030 to support concepts like Expeditionary Advanced Base Operations (EABO), as well as informing the recently released Tentative Manual on Expeditionary Advanced Based Operations. We will continue to refine and update the Tentative Manual with the lessons learned from our FMF experimentation. In the near future, we will release our latest concept—Stand-In Forces.

Much as our 29th Commandant codified maneuver warfare in our principal doctrine MCDP-1 Warfighting to instill a maneuver warfare mindset into every Marine, I felt it necessary to codify how we compete every day around the globe. We recently released a doctrinal publication entitled Competing to instill a competitive

mindset into every Marine, whether above or below the threshold of armed conflict. Marines—and the military as a whole—must be aware that every action or inaction has an effect on reassuring our partners and allies and deterring our competitors. All that we do, from our force laydown, to the activity at each location, to the equipment we buy, signals our commitment to reassure and deter. In a globally connected operating environment, we no longer have the luxury of maintaining a binary combat or garrison mindset; our posture and mindset must be one of continuous competition.

NAVAL EXPEDITIONARY STAND-IN FORCES

Expeditionary advanced bases are a platform for small, mission-tailored groups of Marines to distribute and hide in plain sight with the assistance of advanced camouflage, cover, concealment, detection, and deception (C3D2) capabilities against a competitor who is seeking to locate our forces. Expeditionary advanced bases will enable the convergence of capabilities from multiple domains and create the virtues of mass without concentration. The Marine Littoral Regiment (MLR)—the base unit for our future force—will provide fleet and joint force commanders with persistent, survivable forces that will enable the generation of effects within areas that our adversaries hope to deny to us through their integrated systems of anti-access and area-denial capabilities. In terms of hardware, Marine capabilities will include anti-ship Naval Strike Missiles (NSM) loaded on the unmanned Remotely Operated Ground Unit Expeditionary (ROGUE) Fires; self-sustainment and mobility with the Light Amphibious Warship (LAW); and, long-loiter aerial reconnaissance in an expeditionary environment with the Medium Altitude, Long Endurance (MALE) Group 5 unmanned aerial systems (UAS). Future infantry units operating within the MLR construct will be equipped with organic precision fires to include loitering munitions. The MLRs will be networked with our F-35 capabilities, providing a further layer of combat credibility and sensing. In the future, these forces could employ more advanced munitions such as Tomahawk Land Attack Munitions (TLAM), Maritime Strike Tomahawks (MST), SM-6 containerized anti-ship missiles; and a wide array of unmanned or optionally manned systems to enhance deterrence. Without these long-range precision fires, the MLRs will not be suitable to support the fleets and will lack the ability to influence the vast maritime area your Marine Corps must do.

In the even more critical human domain, these capabilities will encompass the necessary training and education to produce leaders who understand how to deter competitors and provide civilian leadership strategic options across a wider spectrum. The MLRs will offer deterrence by detection through constant surveillance of the competitor, complicating their decision-making calculus if they attempt fait accompli gambits, and doing so while networked into the larger architecture of naval and joint command, control, computers, communications, cyber, intelligence, surveillance, reconnaissance, and tracking (C5ISR-T) articulated in the Joint All-Domain Command and Control (JADC2) concept and previous discussions on Mosaic Warfare.

With global sensors becoming ubiquitous, the value of reconnaissance and counter-reconnaissance or scouting and counter-scouting will increase. Force Design 2030 offers civilian leaders strategic options to identify, deter, and hold accountable competitors challenging U.S. interests or infringing on international norms at any point on the globe. It creates advantage by providing uniformed and civilian leadership with a force capable of denying key maritime terrain to an adversary or to force a change in decision calculus and facilitate de-escalation. Those naval expeditionary forces will also be capable of rapidly sensing, making sense, and acting upon information from inside the enemy's weapon engagement zone (WEZ) in support of the fleet and larger joint force, further complicating adversary decision calculus. These stand-in forces will be able to support anti-submarine warfare (ASW) efforts and help sanitize key maritime straits, thus expanding our strategic undersea warfare advantage. Your Marine Corps is transforming into a force capable of competing and winning the hider/finder competition by proliferating sensors to detect adversary presence, employing advanced C3D2 for resilience, and maintaining a lethal array of long-range precision fires to prosecute targets at a time and place of our choosing—whether ashore or afloat or in the air. Stand-in forces will simultaneously satisfy traditional requirements from the fleet and combatant commanders for a modern, resilient crisis response force capable of responding across the range of military operations. And, as noted in the most recent testimony by the Commander, USINDOPACOM, these stand-in expeditionary forces are further required as the forward leading-edge to any strategic defense in the Indo-Pacific and any maritime defense-in-depth.

From our continued wargaming and experimentation, we have learned much about the utility of multi-domain reconnaissance. As a result, over the coming months a new Marine reconnaissance enterprise will consolidate disparate elements of existing organizations within a structure capable of generating a coherent, persistent, forward-presence focused on key maritime terrain that is vital to U.S. national security interests. The next step will be the development of our Mobile Reconnaissance framework which will deliver expanded all-domain capabilities to our naval expeditionary forces and fleets via a combination of Marine Commandos, manned and unmanned surface platforms to include the Long-Range, Unmanned Surface Vessels (LRUSV) and small boats, manned and unmanned ground Ultra-Light Tactical Vehicles (ULTV), unmanned aerial systems, and unmanned sub-surface vehicles. As with other force design efforts, these forces will be fully capable of networking with our 5th generation F-35 capabilities as well as connecting with the larger joint architecture.

In addition to offering continuous surveillance in the contact layer, the MLR increases lethality, disbursement, mobility, and survivability in a way that our current stable of large, expensive, high-signature platforms cannot match to deter and counter aggression in critical regions. The MLRs will provide a unique expeditionary advanced base capability, but they will not be the sole definition of the FMF as our Marine Expeditionary Units will remain our “crown jewel.” Your Marine Corps can compete, deter, and win as part of a naval expeditionary force operating in international waters and with light footprints ashore on the territory of local allies and partners. It does not require the sustained presence of heavy ground forces or the regular deployment of large, land-based aviation elements. These unique capabilities make the Marine Corps the ideal choice for a force-in-readiness that serves as the backbone of the contact layer because our forces can cooperate with allied and partnered nations without burdening their local infrastructure, whether for steady-state operations or disaster response operations. Additionally, the sensing elements of the FMF coupled with lethality are key attributes in preventing conflict.

POSTURE

21st century strategic competition requires a new posture to deter modern threats. Our current force posture is strikingly similar to the one designed coming out of the Korean War. That posture was designed to deter and confront a Soviet threat that consisted of strategic bombers and Intercontinental Ballistic Missiles. Over the last two decades, our strategic competitors took note of our strengths and designed forces specifically to counter them. We must now adjust our posture against the pacing threat of China due to its ability to hold our fleet at stand-off ranges and prevent significant force projections. This does not mean abandoning our forward position of advantage, but rather adopting a more robust and resilient forward-deployed posture as described in testimony by Admiral Davidson as part of a larger defense-in-depth.

Marine forces working with Navy ships must occupy space within the contested first and second island chains in the Indo-Pacific with the ability to effectively operate in all domains. Guam remains one of our most important strategic locations as it is US territory located closest to contested maritime regions. In order to effectively deter by detection, our forces must be within sensor and striking range to impose cost on the adversary through their allocation of limited C5ISR-T assets or determining that the cost is too high to attempt anything that would cross the line of established international laws and norms. However, while Guam remains a strategically important location within our larger defense-in-depth, we must not ignore the potential impacts to it due to the adverse effects of climate change. We must take the necessary steps to protect Guam and the strategic advantage it provides.

Our posture includes more than the laydown of our forces around the world, it also must include what our forces are doing in those locations. As Secretary Austin has told us, “our success will depend on how closely we work with our friends around the world to secure our common interests and promote our shared values.” Marines regularly conduct training with allies and partners globally. This training is beneficial to building trusting relationships and interoperability. These relationships are not—and should not be—one way, in that US Forces tell partners and allies how to operate. We can learn from other nations as much as we can teach.

For example, the Japanese Amphibious Rapid Deployment Brigade may have used the U. S. Marine Corps as an example in its development, but we have much to learn from them based on how quickly they designed, assembled, tested, and operationalized the brigade. Our commitment to working with allies and partners creates a mutually beneficial relationship for our military organizations while simul-

taneously signaling our resolve to competitors. Initiatives like the Pacific Deterrence and the European Deterrence are so important in supporting our posture.

COMPETITION AND RISK

Some critics of our Force Design 2030 suggest that non-stealthy platforms such as the LAW, LPD-17 class amphibious ship, and the current Group 5 UAS are operationally unsuitable for high-end warfighting. This critique's foundational assumption is that our decades-old stealth technology or military-standard naval architecture will be overcome with technological countermeasures and that stealth technologies will become affordable enough to proliferate the operating environment in large quantities. Survivability under such conditions is likely to prove far more a matter of quantity, dispersion, signature management, and distributed lethality than of being able to avoid technical detection or defend against all threats. We must view survivability in terms of the entire system—the entire system must be able to survive long enough to accomplish the mission vice an individual platform. The expeditionary system of platforms our Marines employ—and the networks they operate on—must be capable of competing and deterring below the level of armed conflict as well as fight at the high-end to reassure our partners and allies as well as demonstrate a credible capability to a would-be adversary. For example, while not a part of the currently envisioned program, LAWs operating in plain sight with containerized missiles could effectively compete and deter. Such a reimagining of the program could involve greater costs, so we will have to study the benefits and make resource informed decisions about tradeoffs in capabilities and capacity. Traditional amphibious ships, such as the LPD-17s, possessing tactical advantages derived from well-decks will confound adversaries and force them to consume resources attempting to positively identify those capabilities loaded inside—whether unmanned surface vessels, unmanned underwater vessels, or more traditional capabilities. Long-endurance Group 5 UAS, like the MQ-9, also provides the persistent presence necessary to win the hider/finder competition for the fleet. Additionally, a proven platform like the MQ-9 supports quickly learning the platform through the experience of the US Air Force while continuing adaptation and innovation over time as we procure the future system.

If competition expands from opening volleys or punishment strikes to large-scale conflict, the Fleet Marine Force offers the Joint Force Commander a persistent stand-in force capable of conducting reconnaissance, counter-reconnaissance, and targeting in the blunt layer. A stand-in force with the ability to support allies and partners while striking the adversary with long range precision fires, 5th generation short take-off and vertical landing aircraft, and a host of electronic warfare options combined with the mobility of the Amphibious Combat Vehicle (ACV), LAW, and unmanned surface and undersea vehicles provides a survivable option to buy time for the remainder of the joint force to bring war-winning capabilities.

LOGISTICS AND RESILIENCE

Sustaining the force we are developing now becomes even more critical in the years ahead. The relative ease with which we have been able to project power into the Middle East over the last few decades has lulled us into a false sense of security. As a result, we have optimized service logistics efforts to support requirements without regard to the threat actions that could disrupt them. My predecessor said “we are going to have to fight to get to the fight.” I will take that a step further by saying we will have to fight to sustain our warfighting efforts over time. The Joint Logistics Enterprise must connect our emerging operational concepts at the tactical edge all the way back to the defense industrial base. We have been an end user of the system, but that needs to change. We must develop new methods for the Naval Force to enable broader joint force sustainment efforts. On a day-to-day basis, today's distributed force strains our systems to the limits. This will only get more challenging considering the dynamic, evolving threats that competitors can apply against our supply chains, manufacturing bases, and global sustainment network.

Based on anticipated funding levels and the additional budget uncertainty that has been introduced by the COVID-19 response, we must clearly consider risk as we move forward. Our force design efforts for the future will provide the context necessary to make the difficult choices for our installations and logistics enterprise. We can no longer accept the inefficiencies inherent in legacy bureaucratic processes nor accept incremental improvements. In order for our installations and logistics organizations to change effectively, we must better understand the implications that Force Design 2030 will have on the FMF across multiple time horizons so we can resource our installations and logistics enterprise appropriately. In coordination

with partners both inside and outside the service, we will evolve our organization to meet the future FMF's operational requirements in the air, on land, and at sea while continuing to provide world-class support to the force today. This may require a change in the existing command relationships between the bases and stations and the forces they support. I will keep the committee fully informed of any such changes as our understanding evolves. Finally, in an effort to modernize our bases and stations in a manner commensurate with our overall force design, we are experimenting with advanced force protection systems enabled by artificial intelligence at several of our installations. This capability is promising and may provide the service an opportunity to greatly enhance the protection of our installations while drastically cutting personnel costs.

MAJOR DEFENSE ACQUISITION PROGRAMS

I have always operated under the assumption that evidence, wargame findings, modeling and simulations, and my own best military advice as Commandant would persuade people across the defense enterprise and within Congress that we need change now. While I remain convinced that this assumption remains valid and look forward to a continued dialogue with the Committee, we have more work to do to persuade key audiences of the merits of our desired changes. Congressional support for Ground Based Anti-Ship Missiles (GBASM); LRUSV; Medium Altitude, Long Endurance UAS; and I believe that Light Amphibious Warship (LAW) will be essential to our modernization efforts. We will continue to work with the Congress to demonstrate the importance of a rapid acquisition of these critical capabilities. I have repeatedly asked for Congressional support to change legacy programs that are no longer operationally relevant or have become cost prohibitive, as well as support for new initiatives that create a relative warfighting advantage. This is the kind of agility we will need going forward in order to sustain that warfighting advantage.

Based on my understanding of the strategic challenges before us and my desire to remain the best steward of taxpayer dollars, I am convinced that we must be willing to critically assess the scope of current Programs of Record for our Major Defense Acquisition Programs (MDAP). As we reduce the end strength of the Marine Corps in order to internally fund our modernization, each MDAP must be reevaluated for capacity and sustainability. We will need the continued support of Congress to re-scope any program that exceeds our requirement or is unaffordable to procure, man, and sustain.

In addition, we should acknowledge that up to three quarters of a weapon system's cost occurs in sustainment—the operational and maintenance upkeep after the initial acquisition. With the new procurement of large weapon systems like the F-35B/C, CH-53K, MV-22, JLTV, and ACV—to name but a few—we should be prepared to modify programs of records to ensure affordability and viability throughout the entire lifecycle of each program. Prioritizing high-end platforms without resourcing the supplies and infrastructure needed to sustain its operational capability is fundamentally irresponsible; the result would be a hollow force.

With every dollar we expend to upgrade a legacy platform that is no longer survivable against a peer competitor, we are slowing our rate of transformation. Our competitors no longer wait to see what America does and follow suit; they have embarked on their own trajectory, which currently outpaces ours. Our Force Design 2030 addresses this problem by forcing the competitor to adapt to us through the tactical, operational, and strategic challenges a truly modern force presents. This does create domestic dilemmas as we are forced to transition from legacy platforms built in certain districts to modern and relevant equipment that may be built elsewhere. However, if we are to succeed in this great power competition, we must make those difficult choices. I remain confident that this can occur in a responsible and balanced way, without creating winners and losers, and look forward to discussions with each of you on a way ahead that satisfies shared interests.

The Marine Corps remains constrained by an acquisition process that tries to eliminate risk—risk poorly defined as uncertainty. We must recognize that incrementally better versions of the current Marine Corps is not going to be enough for real great power competition. As noted in the House Armed Services Committee's Future of Defense Task Force Report 2020, our acquisition process is too sluggish to work effectively at scale with many technology companies, as they need to innovate and compete daily to survive in their dynamic industry. With the rapid transition we need to make over the next decade, we must be willing to incur some short-term risk to better prepare and compete in the future. The ability to prototype new technologies, then aggressively experiment and exercise with prototype equipment to understand its full capability on the battlefield is paramount. Lastly, I agree with the Report's recommendation that we need a process that better bridges the "valley

of death” to transition critical prototype equipment into full-scale fielding without taking years through the traditional planning, programming, budgeting, and execution process.

READINESS AND STRATEGIC ADVANTAGE

As we build a more capable and lethal force, we must also take into consideration the readiness of that force. Since 2017, the Marine Corps has significantly increased the availability of forces to Combatant Commanders based on the generous funding of Congress. As Marines deploy forward in support of operational requirements, they buy down today’s risk by deterring competitors from violating international norms while assuring allies and partners of the strength of our commitments. However, the mere availability of those Marines does not equal readiness to compete in the maritime gray zone, nor does it create strategic advantage to deter or defeat rapidly evolving threats. It is time for us to embrace a more sophisticated and balanced understanding of military readiness and cease using availability as the primary metric in our readiness evaluations. This antiquated model is hugely consumptive and forces us to spend limited resources ensuring the availability of platforms designated for retirement and replacement. This also applies to equipment that we are attempting to transition to more modern capabilities. For example, every dollar spent to make a 4th generation aircraft that has exceeded its intended service life is a dollar that cannot be spent to accelerate the fielding of 5th generation very low-observable aircraft and advanced UAS. We must invest in future capabilities that create, maintain, and expand warfighting advantage to ensure a ready force tomorrow that maintains its ability to compete and deter.

During the most recent conflict between Armenia and Azerbaijan, Armenian ground forces that we would have labeled ready based on availability, were easily targeted and destroyed by Azerbaijani forces employing elements of a precision strike regime to include swarms of loitering munitions and lethal unmanned systems. While Armenia’s tanks and infantry fighting vehicles were available, they were not operationally suitable, thus not ready for the conflict. As our competitors continue to expand their capabilities, we will soon find ourselves outmatched unless we change our readiness framework. To do so, we should embrace a new readiness paradigm in which availability ranks behind generating a relative warfighting advantage. A ready capability in the future must be one that is both available when we need it and creates a strategic warfighting advantage against a specific threat in great power competition and conflict.

A ready force that creates a strategic advantage over the pacing threat must be organized to generate faster decision cycles against the enemy. A large part of our Force Design 2030 efforts is aimed at developing the right capabilities for the future force, but just as important is devising the correct organizational model to employ those capabilities. I do not support creating more or larger headquarters organizations to accommodate the larger quantities of data coming in as I feel this will only slow the decision-making process. I’m also not committed to organizations that we have employed in the past if they don’t work to fulfill our future requirements. In addition to right-sizing our FMF, I’ve also directed an ongoing assessment to reduce 15% of our personnel across Headquarters Marine Corps to generate savings that we can reinvest into our warfighting capabilities without losing the institutional processes necessary to support an adaptable force.

Your Marine Corps, and the Naval Service as a whole, have a proven record when it comes to driving change. Both the People’s Republic of China and Russia modernized their militaries over the past decade based on what they assessed as our strengths and our competitive warfighting advantages. They adapted their operational and strategic approaches to counter us and now we must modernize in order to remedy shortfalls and drive the next cycle of change. Simply making our legacy platforms better or more of them available will not force our competitors to change course, nor will it create the strategic advantage required. I concur with the Air Force Chief of Staff General CQ Brown: we must accelerate change or lose.

One way we can accelerate change is by seeking a more nuanced understanding of readiness as it applies to each service or even common force elements within each service, and to ask—how many forces-in-readiness can we collectively afford? A critical factor of understanding readiness is identifying when a joint force will need a capability in accordance with a detailed mobilization plan. The Marine Corps—as well as other critical elements of the joint force—will always be at the front of the timelines because we are the force who is present before conflict and deters an adversary’s early escalation. Serving as the foundational element of our persistent contact layer allows time for the joint force to mobilize and surge the war winning capabilities of the other services. However, without your Marines forward deployed to

tamp back the aggressor and create decision space, the joint force will not have the time and opportunity to deploy.

FLEET DESIGN AND NAVAL INTEGRATION

Thus far, my comments have focused on issues germane to my role as Commandant of the Marine Corps—to organize, train, and equip Marine Corps forces in support of the Fleets and Combatant Commanders. Please now allow me to share a few thoughts with you as one of the three senior naval officials testifying before you and also as a member of the Joint Chiefs of Staff. My experience and role as a senior Naval officer requires that I share my best military advice in the ongoing fleet design conversation. One thing is clear: serious naval professionals both in and out of service agree that the status quo fleet will not provide the strategic advantages required in an era of great power competition, and must change.

I would like to state for the record my thanks to the CNO and his OPNAV staff for their continued support redesigning the fleet and the amphibious/naval expeditionary portion of it without reservation or hesitation in support of our shared understanding of the operational dilemmas created by peer adversaries. The CNO is leading a major change in future fleet design and I wish to acknowledge that for the record, and formally communicate my support. I agree with the CNO that the Navy does not need to be “reimagined” or “reinvented,” and neither does the Marine Corps for that matter. However, as the CNO has noted, how we perform our core roles and functions of deterrence, maritime security, power projection, and sea control must change—just as it has many times in the past.

Being physically present within the area of responsibility is no longer evidence of success, and we should no longer think presence somehow produces deterrence in and of itself. For naval presence to deter competitors, physical positioning must create real strategic advantage. The specific capabilities present must provide a competitive warfighting advantage against specific peer threats and do so in a resource neutral manner. Dispersing large numbers of militarized fishing vessels with a nuclear aircraft carrier may result in the temporary absence of those adversary vessels in key maritime terrain, but it comes at a fiscally prohibitive cost, not to mention the operational cost of not having that warfighting capability postured to project power via its carrier air wing. However, having a robust inventory of submarines, frigates, light amphibious warships, and networked unmanned or optionally manned surface vessels—or even T-AGOS and military sealift vessels—operating in the same region would provide a competitive warfighting advantage without resource prohibitive operating costs. Such a fleet would further reinforce our strategic advantages in undersea warfare through their modern ASW capabilities and our advantages in naval expeditionary warfare. The process of redesigning the fleet will not be an easy or inexpensive, nor will it be accomplished quickly, but it can be done with your continued oversight and support. I wish to thank the Secretary, the CNO, and the members of this committee for their continued commitment to the construction and sustainment of our ships necessary to support amphibious operations.

Not that long ago, the Amphibious Ready Group (ARG) that comprised the Navy ships for the Marine Expeditionary Unit (MEU) consisted of five ships with a combined gross tonnage of approximately 73,000 tonnes. Today, our standard three ship ARG/MEUs operate in a distributed manner from platforms with a combined gross tonnage of approximately 86,000 tonnes. As with many other systems and capabilities across the joint force, our ARG/MEU has become smaller yet heavier, while simultaneously being asked to be more agile. Distributed Maritime Operations is not only the future of naval operations, but in reality—the present. As we modernize our Marine forces as part of our force design efforts, we must also modernize the ARG/MEU. We have seen the great value of disaggregating the ARG/MEU with each individual ship conducting its own mission within the same Area of Operational Responsibility for a Combatant Commander. Greater numbers of smaller ships would allow us to disaggregate for a greater number of mission sets while maintaining the ability to reassemble into a large force with expansive mission sets. Defining our future operational concept will also help drive us to better understand what we need from LXX—or the next class of amphibious ships. We know they will need to be smaller, faster, more lethal, and better networked, but we don’t yet know to what degree we need these characteristics. As we continue our analysis with the Navy, we know that they must be affordable so that we can purchase and maintain the number of ships we need to operate globally. Therefore, our requirements will be matched to a program that is affordable and sustainable over the long-term.

Finally, I wish to state my support for the observations, positions, and conclusions articulated by Admiral Davidson in his most recent testimony. The vision he articulated for a strategic defense to include a defense-in-depth with naval expeditionary

forces postured forward and west of the international dateline is one I share, and have attempted to communicate as often as possible over the previous 22 months. I share his conclusion that highly lethal and distributable expeditionary forces than can generate the effects of mass without the liabilities of concentration are of the highest utility, and am doing everything possible to create such forces via my force design efforts with the Marine Littoral Regiment.

CONCLUSION

The American people expect us to be our own toughest critics, and we are. We have significant strides to make in the near future, but I know the leadership and support of this Congress will help us to revolutionize our approach to competition and conflict. I pledge to keep you informed and involved in the transformation of your Marine Corps. The American people are counting on their Marines, Navy, and joint force to maintain our ideals and way of life now and into the future. The dustbin of history is crammed with once successful militaries, businesses, and organizations that recognized the world was changing and attempted to meet that change through merely incremental improvements in existing ways of doing business. Despite their previous successes, these institutions failed in the new environment because they could not make the fundamental changes necessary to remain on top. We are now in the midst of just such a period of change, and we will need all the help and support of this Congress to ensure we continue our long history of successful innovation and adaptation.

While our aspirations and expectations are great, I am certain that you expect nothing less from your Marine Corps. With your continued support, we shall succeed. We will achieve our goals of transformation, both in our culture and warfighting capability, to best support the naval campaign and the joint force.

Senator TESTER. Thank you, General Berger. And I appreciate all three of your statements. I think it is critically important that you continue to communicate with this committee so that you are prepared to fight the next conflict, not the last one. So, thank you all very much for your statements.

General Berger, your top priority has been the implementation of Force Design 2030. You talked about it in your opening statement. It is a plan to modernize the Marine Corps and ensure it remains the world's most effective naval expeditionary force.

When we consider what it will take to serve as a credible deterrent to China and, if necessary, fight and win future wars, it is essential that our Marine Corps can successfully modernize and meet the challenge.

This subcommittee is strongly supportive of the strategic concepts associated with force design. We must ensure that force design priority programs stay on schedule and responsibly use taxpayer dollars.

So, here is my question, General Berger. Your unfunded priorities list contains several items that would accelerate the Marine Corps' long-range fires program, increase troop mobility, improve command and control capabilities. Where does the unfunded priorities list provide us opportunity to accelerate force design implementation?

General BERGER. Part of the challenge, Chairman, and as you all are well aware, is that in a pacing threat environment, like we are at right now, both of us are moving. Add to that the speed at which technology is developing.

So, the items on our unfunded priority list, as you mentioned, Chairman that is what we need to ensure we stay in front. We are very ready today, but those items will allow us to be ready in the future, in front of our adversary, with some margin of error, which I believe we must have.

So, things like ground-based, anti-ship missiles, the G/ATOR Radar, the CH-53K, those—the MQ-9 Reaper, those will allow your forward force, your stand-in force, to deter effectively forward, in the future, as well.

Senator TESTER. Are you confident the programs you are requesting funding for in fiscal year 2022 can deliver results quickly?

General BERGER. Absolutely, yes.

Senator TESTER. Okay. And how are you balancing the need to move quickly on strategic concepts while keeping those costs affordable?

General BERGER. We are small enough that we could not set aside an experimentation force in the Marine Corps. So, for example, Chairman, what we did is we have three Marine divisions in the Marine Corps. You pick one battalion in each division, outfit it differently, organize differently, equip differently, and train differently. And for the next 18, 24 months, we will experiment with all three. And the rationale behind that is that is how we are going to learn faster. That is how we are going to introduce the results of experimentation in war gaming into our force design process at speed.

Senator TESTER. Thank you.

Admiral Gilday, recent media articles suggest that the Navy is expecting to face a challenge in next year's budget request and will have to make some difficult funding decisions on how to proceed with the Navy's modernization act. These funding decisions will only become more difficult in the future as the Navy continues to modernize and introduces new weapon systems and programs, like next-generation submarines, surface combatants, and aircraft.

So, Admiral Gilday, we never are going to have enough money to do everything that we would like to do. That is a fact. Which generation systems and programs should be prioritized in the upcoming budget request?

Admiral GILDAY. Sir, thank you. So, big picture, what my intention, or our intention to do with our investment strategy, is to field the most capable, most lethal, most ready force that we can, given the topline that we have. And, so, we have not come off of our priority to continue to invest heavily in readiness and training of the force that we have today because that force needs to be forward to be relevant.

With respect to modernization, key programs include hypersonics. We have doubled our investment in hypersonics and R and D. I think that is a very reasonable investment strategy based on the fact that we are ahead or on track with every milestone in that program, including a very successful multi-thousand-mile test last year and a successful new generation engine burn just a month ago, working very closely with both the Army and the Air Force on that particular project.

Likewise, on the defensive side, directed energy is an important investment for us with respect to fleet survivability. I mentioned up front in my opening statement that the major investments by the Chinese are in space and missiles. We have to have a way to defeat those missiles, and I think an afford—the most affordable way to do that is the defense-in-depth type of framework that in-

cludes laser energy. We have those systems now at sea and are fielding.

Senator TESTER. So, I just want to flesh this out just a little bit more. All four defense committees are going to be making decisions soon on what changes we are going to make to the 2022 budget requests. What views do you wish to share about your investment priorities today so that we might avoid disagreements on what systems deserve more funding?

Admiral GILDAY. Yes, sir. So, if I start in the undersea, that is our most survivable strike platform in the United States Navy, and arguably in the U.S. military. Our underwater superiority over the Chinese, we must maintain that overmatch.

With respect to surface, continue investment in new ships. We know that our cruisers are nearing 35 years old. We need to replace those. We are going with a smaller, more distributed force.

The frigate investment is really important, as are the long-range weapons we are investing to put at sea, and hypersonics on our first—on our Zumwalt-class ships by 2025.

If it needs to be balanced across the three domains, sir—under the sea, on the sea, in the air. The fourth- and fifth-generation mix of aircraft that we are fielding by—we are fielding now, this summer, with our first deployment. But, by 2025, we will have five to six squadrons. And, by the end of the decade, we will have all nine squadrons that have that mix of fourth and fifth. We want to keep that on track, as well.

Senator TESTER. Thanks, Admiral.

Senator Shelby.

Senator SHELBY. Thank you. Thank you, Mr. Chairman.

Secretary Harker, the Administration's budget proposal includes a request for new language to authorize multi-year procurement contracts for multiple ship classes, including the destroyer, while at the same time breaking the current multi-year contract for the destroyer.

My question is this. How does the Navy, sir, plan to measure the impact of its proposal to breach the current destroyer multi-year contract on the cost of future multi-year procurements? In other words, how can Congress and the industrial base trust the Navy to fulfill its commitments to multi-year contracts, which I think are important?

Secretary HARKER. Thank you, sir. Yes, multi-year contracts are very important to us. We do intend to sign another multi-year for DDGs starting in 2023 through 2027 and continue that procurement into the foreseeable future.

DDG-51 is a very valuable asset for us. We really struggled with the decision to take that out of this year's budget. It was the hardest decision we made, and we would love to have been able to include it.

Going into this next year, we are committed to multi-years for both submarines and for DDGs. Over the last multi-year period, it was a 10-ship, multi-year over a 5-year period. With the assistance of the committees and the Congress, we were able to purchase 10 ships, so the one that is in our budget this year will be an eleventh ship. That gave us the ability to not buy the DDG this year, but it was a very difficult decision for us, sir.

Senator SHELBY. Sir, do you believe that it is very important for the industrial base to believe that the Navy is going to fulfill their contracts?

Secretary HARKER. Yes, sir, I do. Very much so. It is critical for our industrial base.

Senator SHELBY. Okay.

Secretary HARKER. And we believe that we have a strong working relationship with them.

Senator SHELBY. Sir, in the final year of a 5-year multi-year procurement contract for Arleigh Burke-class destroyers, this subject—despite the multi-year contract, in—the 2022 budget request includes only one destroyer rather than the contracted two. This is perplexing because of the Navy's number one unfunded requirement is \$1.7 billion for the second destroyer. Seems like a contradiction.

Admiral Gilday, why did the Navy remove one destroyer from its 2022 budget proposal? Is it no longer needed or is that just playing with the budget, the numbers?

Admiral GILDAY. No, sir, it was not playing with the numbers. So, I go back to the thesis of our budget proposal, which is to field the best, most capable, most lethal fleet that we get—we can, that is 296 ships, and make it the best that we can, including a modernization plan that gives us increased capabilities, and then growing the Navy at an affordable rate.

And, so, it was a balance across those three areas, sir. And as the secretary said in his opening statement, based on incidents like the collisions in 2017, we are unwilling—at least my best advice, sir, is to continue to prioritize training and readiness as our job priority.

Senator SHELBY. I think it is a given by this Committee on Appropriations, Defense to—not to shortchange the Navy, not to shortchange readiness, and also future weapons. And, if we do it, we do it at the peril of this Country; would we not?

Admiral GILDAY. Yes, sir, I believe so.

Senator SHELBY. General Berger, I will direct this to you, sir. In 2019, the U.S. Marine Corps' unfunded requirements list totaled \$235.9 million. In 2020, it was \$2 billion. In 2021, it is \$769.8 million. This year's unfunded requirements list from the Marine Corps is as much as all 3 years' lists combined, totaling nearly \$3 billion, according to our committee.

General Berger, has the Marine Corps been resourced adequately to support your force redesign and maintain pace on modernization priorities and readiness? In other words, sir, what is the impact of such a significant unfunded requirements list to the Marine Corps if left unfunded?

General BERGER. If left unfunded, I think for all of our unfunded requirements list, it equals risk. That is probably the simplest way to categorize it. We are learning as we go with force design. We did not know 2 years ago exactly what the Marine Corps would need to look like a decade out. We have a much clearer picture now.

So, in order to give the committees a larger menu to select from with a clear picture of where the Marine Corps is going, we added to the unfunded priorities list. But, those things near the top that are not funded equal risk, equal strategic risk.

Senator SHELBY. And I will direct this, my last question, to you, Admiral Gilday. The submarine industrial base, construction of the new Columbia-class submarine is now underway at shipyards that are already working on the Virginia-class submarine. You know all of this.

The schedule for the Virginia boats has fallen off of the 2-year per year delivery cadence of the Block III boats, and current ships under construction are as much as 2 years behind delivery, is our understanding.

Admiral, what is the Navy doing to get the delivery cadence of the Virginia back on track as work on the Columbia begins to pick up? And, how is this investment in the so-called integrated enterprise plan paying off in terms of industrial-based readiness and cost reduction to our submarine program?

Admiral GILDAY. Sir, in terms of capacity, I think it is fair to say that our submarine industrial base has probably never been as busy as they are today. We have 12 boats under construction right now. We are going to deliver two this year. I think we will christen Rickover by the end of July.

Right now, we are moving at a pretty good pace to put—to build two per year in terms of subcomponents. That then needs to go to the larger components and they need to be able to build at the rate of two submarines a year, as well.

The investments that the private yards are making include hiring more people, the training that is associated with that. The advanced funding that the Congress has given us, that has allowed us to buy spare parts and materials to help neck down or reduce that delay in those submarine builds.

We are watching the Block IV Virginia class very closely. Those delivery dates are not where they need to be, but they are moving in the right direction to the left.

Senator SHELBY. Thank you, Mr. Chairman.

Senator TESTER. Thank you, Senator Shelby.

Senator Schatz.

Senator SCHATZ. Thank you, Mr. Chairman. Thank you all for your service. Good to see you all.

I am going to start with General Berger and talk a little bit about Marines in the Pacific as part of the Defense Policy Review Initiative.

The plan to realign Marines began with a series of conversations between the U.S. and Japanese governments in 2002. It became official in 2006. There were some changes in 2012. And, stipulating to the fact that, as Senator Mike Mansfield says—said, excuse me that the bilateral relationship between the United States and Japan is the most important bilateral relationship that we have, bar none, and that we should keep our commitments to our greatest ally in the region.

It still seems to me that whether it is lift, whether it is the difficulty in finding a replacement facility, whether it is the challenge of construction on Guam, whether it is beddowns on Oahu, that—and maybe more importantly, that the whole region has changed.

I would like to be reassured that we are striking the right balance between maintaining our ironclad commitment to the Japa-

nese government and still maintaining the flexibility to make sure this thing makes any sense at all.

General BERGER. I think, Senator, your characterization—I would see it exactly the same way. That agreement that was made 9 years ago did not account for, to your point, where the world is right now. I think this is the driving force behind the Secretary's effort right now to do a global posture review because it is not set right for the future. I think he senses that, and he has driven us to undertake a global posture review.

Within the Pacific, I think the view from Japan, to your point, and the view from the U.S. is the threat from PRC (People's Republic of China), from the PLAN, their military, is significantly different than it was in 2012. We have to have forces stationed forward and deployed forces if we are going to have a best chance of preventing the next conflict.

But, the laydown of DPRI (Defense Policy Review Initiative) is worth revising, it is worth looking at, because it was set under different conditions. This is going to be led, as you know better than me, by diplomacy, by an effort with the State Department to work with Japan on what is the best way forward.

Senator SCHATZ. Thank you very much.

Secretary Harker, the Navy's reliance on fossil fuels contributes to a vulnerability. The President issued an executive order to all Federal agencies, including the DOD (Department of Defense), to use their procurement authority to move the Country towards carbon-free electricity by 2035.

So, can you talk about the new things that the Navy is doing pursuant to that? And, as you probably know, I have been tracking this issue for a while, so I am not as interested in pilot projects or separate programs related to clean energy, but more importantly, how we are integrating the President's EO in all aspects of bases, installations, fuel, forward deployments, the smart grid, all of that.

And, I think it is really important that we do not silo clean energy into some space called pilot projects and environmental initiatives and bases and installations and environment, but, rather, to understand this as core to the mission, and therefore core to the way we do our procurement. I am wondering if you can comment on that.

Secretary HARKER. Yes, Senator, definitely. I have looked into this since taking this job, and I have been to several of our bases where we have done a lot to improve our ability to provide a carbon-free energy footprint and to take more advantage of things like solar and wind generation.

I was down at Parris Island on a trip there. They have a huge solar energy capability there that they have built on some old abandoned runways. We have other bases that have been doing that, and it is something that we are focused, where each installation has a climate installation plan focus to try to improve how we are doing in this area.

Senator SCHATZ. And are you integrating that into your requirements when you do the procurements of energy more generally? Again, establishing like a climate person at each base and installa-

tion, that is great, but what matters is your RFIs, your RFQs, your RFPs.

Secretary HARKER. Yes, sir. I know there is projects that focus on this on the R and D side, and we are including it in future requirements.

Senator SCHATZ. Okay. And final question. I want to talk to you about operational energy. What are we doing to make ship hulls more hydrodynamic and our combat aircraft more fuel-efficient?

Secretary HARKER. So, I am going to ask the CNO (Chief of Naval Operations) to help me on that.

Admiral GILDAY. So, our—right now, we are collaborating with industry in a new design for DDG(X), and that will include taking a look at the latest industry best practices with respect to improved hull forms. It is the same thing as we look at a new class of submarine we call SSN(X). The initial R and D that we are putting against that project, again, collaborating very closely with industry, is to look for a submarine that will travel higher speeds, and part of that is based on the shape of the hull.

Senator SCHATZ. Thank you.

Senator TESTER. Thank you, Senator Schatz.

Senator Collins.

Senator COLLINS. Thank you, Mr. Chairman.

Secretary Harker, Admiral Gilday, let me start by thanking you both for coming to the great State of Maine to visit Bath Ironworks and the Portsmouth Naval Shipyard. I know that you saw that they are outstanding assets that are critical to the Navy and our industrial base.

Nevertheless, let me be blunt in my assessment of this budget. It is not close to adequate to meet the challenges that we are facing around the globe. It does nothing to help us counter the increase in the Chinese fleet. In fact, it goes in the opposite direction, and the disparity will be even greater.

And, third, it jeopardizes our industrial base where we have only two yards building large surface combatants. And the information I have is that, if this budget is enacted, that 500 skilled jobs will be lost next year at one of those yards, and even more in subsequent years.

So, my question to you is also blunt, and that is, was the DDG excluded from the budget simply because you were given an inadequate top line that you had to meet? Secretary Harker, we will start with you, and then Admiral Gilday.

Secretary HARKER. Thanks, Senator. I really appreciated the opportunity to tour both Bath Ironworks and the Portsmouth Naval Shipyard with you. The workers there were outstanding, and the integration between labor and management at Bath Ironworks and at the shipyard was just a model for all of our shipbuilding and ship maintenance facilities, and that is something that we definitely want to keep and invest in.

We were unable to procure the DDG because of funding challenges. We did not have sufficient funds in the budget for us to be able to meet the balanced needs of providing a ready force today, the capability that each of the ships needed, and then the capacity of adding that additional destroyer. So, as we went through and we

balanced things out to provide the best budget we could, we did not have room for that destroyer in the budget.

Senator COLLINS. Admiral Gilday, do you have anything to add to that?

Admiral GILDAY. Yes, ma'am. It was absolutely an affordability issue. We fought for that hull right to the bitter end. And, if you take a look at where the money would come from to pay for that additional destroyer, we are decomming—or our proposal is to decommission 15 ships, old cruisers primarily. We would be taking money out of manpower, out of spare parts, out of ammunition, and we have learned those lessons in the past, that that is a bad place to take that money from.

And, so, it really did come down to priorities. As difficult as it was to break the multi-year and to send mixed signals to industry, it really did come down to prioritizing the investments that we had to make right now in the fleet that we have today.

Senator COLLINS. And our job, I would suggest to the Chairman and Vice Chairman, is going to be to look across the entire government and every department's budget as a full committee. Because when you see the double digit increases for all of the civilian agencies, and then you get to the Department of Defense and the Department of Homeland Security and essentially see a cut, in real terms, is just our priorities are out of whack here. And, I hope that we can remedy that.

I just, Admiral Gilday, want to quickly touch on the Shipyard Infrastructure Optimization Plan. That includes 250 million for the second increment of the Portsmouth Naval Shipyard's multi-mission dry dock number one project, and that is really important, as well. Could you explain to the committee what will happen if we do not provide that funding in terms of the ability to return submarines and sailors to the fleet?

Admiral GILDAY. Yes, ma'am. It is my judgment that if we do not fund that, if we do not fund that project in 2022 adequately, it will put at risk the ability to do our first availabilities on Virginia class submarines beginning in fiscal year 2026.

The project up there in Kittery, at Portsmouth, is absolutely critical for us to have that East Coast capability. We are simply not going to have it. We do not have dry docks large enough to put those ships, to put those hulls in, to do the maintenance on them that is required.

Senator COLLINS. Thank you.

Admiral GILDAY. Yes, ma'am.

Senator TESTER. Thank you, Senator Collins.

Senator Murray.

Senator MURRAY. Thank you very much, Mr. Chairman. Thank you to all of you for being here today.

Secretary Harker, let me just start with saying—by saying that I was really pleased that the Navy decided to base the first new Constellation-class frigates at Naval Station Everett. As you well know, Everett is a really important base for the Navy, and we have to continue investing in that base and the community for the long term.

I wanted to ask you today what additional investments at Everett are going to be necessary to accommodate those new ships or additional sailors and their families?

Secretary HARKER. I do not have that information with me, ma'am, but I know we are committed to making sure that we do not send our ships out there without the additional crew facilities necessary for both the crew and the families and so on. The CNO may have additional points.

Admiral GILDAY. Yes, absolutely. So, that work is ongoing right now. The hulls go in the water in—the first hull will be delivered in 2026, ma'am. So, in addition to things like housing, childcare, training facilities that we will need for those crews, as well. So, we will look at it holistically so that we do not cut those crews and their families short.

Senator MURRAY. Good. All right. Well, I look forward to working with you on that as it continues.

General Berger, I did want to ask you. You are proposing the boldest rethinking of the Marine Corps role and structure in decades. And, as part of that, you are proposing to cut end strength and have smaller units operating from inside the area our adversaries can strike.

How will training need to change to prepare our Marines for those missions?

General BERGER. Training will have to, one, take the individual Marine to a higher level than they are right now. From recruitment, in other words, through their entry-level training, to their first unit, we have to raise the bar because we are going to expect non-commissioned officers and junior officers to make decisions than two levels up than they make today.

When we are more distributed, when we are more spread out, then junior leaders are going to make the calls, especially if you are in a high-threat environment where they are kind of challenging your communications. They are going to make their decisions independent of probably great communications with their higher headquarters. So, our training for them has to get higher.

We are lengthening, for example, infantry training right now by 50 percent this year. It has to be longer. It has to get them to another level. The same individual that now maybe three people have three different skill sets, we have to make sure one person has three skills sets, if you follow me.

Senator MURRAY. Yes.

General BERGER. So that one person is not a corpsman and one person is not a machine gunner and the next person is a sniper. We have to have people with multiple skills. So, I think we will raise the bar in training to make sure that we can empower and train them to a level where they can make the decisions on the spot.

Senator MURRAY. How do you expect this to increase the operational tempo? And how are you going to support Marines' families during more frequent or longer deployments that you envision?

General BERGER. Separate issue on the frequency of deployments, and that is really driven by what the Nation needs year to year to year.

But, the difference in force design, ma'am, is from the beginning. Our premise was, we are going to build a force that is manned at 100 percent in the Fleet Marine Force. That is not the case right now. We take risks. In other words, we man them at less than a hundred. But, we are buying—we are building the Marine Corps manned at 100 percent. When you do that, then you can accept an increase of surge for periods of time.

But, your point on the stress on the families, absolutely so. When we deploy forces like we have right now onboard naval ships and it is a planned 6- or 7-month deployment, you know, that is tough. When it is extended, it is to a whole other level because then you are into unpredictable land for them. All of which is manageable, but we need to run the machine at a pace we can sustain, which I think you are highlighting, ma'am.

Senator MURRAY. Okay. Thank you.

And, finally, a vote has been called, so let me just say this, Secretary Harker. The Department of the Navy has been pursuing a number of actions that are—I am concerned are very harmful to workers in my home State of Washington and which jeopardize the stability of the industrial base, and those include proposals to divest UAVs (Unmanned Aerial Vehicles) and virtually brand new patrol boats, changing shipbuilding specifications to circumvent Buy American requirements in appropriations law, and a lack of clarity on the disposition of a dry dock.

I have not gotten satisfactory answers on that. There is not time right now. But, I want to know if there—what reasonable alternatives are considered, and I would like to follow up with you and my staff on that.

Secretary HARKER. Yes, ma'am, definitely. I will follow up with you on that. I know I have been out to the dry dock there over in Bremerton. And I have talked with the shipyard commander there, and I am fully committed to the shipyard infrastructure optimization effort to renew or replace that dry dock and part of our effort to modernize that. And then the other areas, we will definitely get back with you, ma'am.

Senator MURRAY. Okay. I appreciate that. Thank you.

Senator TESTER. Thanks, Senator Murray.

Senator Baldwin.

Senator BALDWIN. Thank you, Mr. Chairman. We are very excited to be building the new frigate in the State of Wisconsin. However, even though this ship is based on proven hull design, new ship classes often experience challenges related to technical concurrency, cost overruns, or schedule slips.

As you know, it is important that our acquisition programs account for these challenges, which means requiring things like technology maturation, systems integration, and full-ship tech data.

I believe these milestones should be achieved prior to bringing on any additional shipyards should the Navy want to increase their buy down the road. Similarly, to avoid affecting the production ramp up, we must avoid any gap-year funding for the frigate.

So, can you—this is to Secretary Harker and Admiral Gilday. Can you commit to requiring these technical milestones are met prior to bringing on a second shipyard? And, can you also commit to avoiding gap years in the procurement profile?

Secretary HARKER. Yes, ma'am. So, first, I have been out to Marinette and have been working with that shipyard for probably 20 years, since I was back in the Coast Guard as the business manager for the buoy tender acquisition project. So, I have got a lot of great experience, a lot of respect for the people that work at that shipyard.

As we go forward, it is definitely something that we want to do is make sure that we do not make mistakes by delivering ships that are not fully mature and proceeding down that road. So, I think there is definitely a need to make sure we get the technology mature, and that is something that I believe the CNO has some thoughts on, as well.

Admiral GILDAY. Yes, ma'am. So, we are—with respect to risk in building that ship, I was just on a FREMM class over in Europe three weeks ago. Really impressive. Really impressive hull. So, we have done this before to minimize risk, where we have taken an existing hull and put a known combat system, a weapon system, on it. We did this back in the '80s and it worked out really well between the Ticonderoga-class cruisers and the Arleigh Burke DDGs.

It is the same type of approach that we have up in Marinette. I went to Marinette myself. That was a—you know, it was a great trip, number one, to get to talk to the ship workers. But, I will say that that risk is something that we are carefully trying to manage. We are not introducing new systems, trying to create success or miracles that have to all line up before the ship delivers in 2026.

So, I am highly confident that both the Navy and the shipyard are working very closely together to make sure we are not introducing any additional risk into that build.

With respect to moving to a second yard, I am taking a very conservative approach myself with respect to anything that we would do in that regard. I understand the benefits of the industrial base, but we have to get that right and we have to leverage what we have learned from other builds, like the LCS, to make sure that we get that right.

The last thing I would say is that predictability with respect to budgets, especially shipbuilding, are really important for industry, and I recognize that. One of the things that struck me at Marinette was the amount of infrastructure that they are building to support the Constellation-class frigate. So, if we change those numbers, that—those investments are going to be a waste. I recognize that, ma'am. And again, I take the formulation of the budget very seriously in terms of how we prioritize and the message that we send to industry.

Senator BALDWIN. Thank you. I appreciate that focus on the industrial base.

And I think we have observed that the shipbuilding industrial base has become more fragile over the last 25 years. Congress has invested significant additional funding to support submarine- and ship-specific workforce and supplier expansion programs, which has really paid off for programs like Columbia, Virginia, and DDG-51. The same rationale for those industrial-based programs holds true for the frigate.

So, do you believe that these types of congressional investments have benefitted the Navy fleet, our industrial base, and our national security? And, if so, do you agree that similar investments into the frigate industrial base and workforce will have the same positive results? And, again, to you, Secretary Harker and Admiral Gilday.

Secretary HARKER. So, yes, definitely. Investing in our industrial base is something that is critical for us. We used funds from the Defense Production Act Authority to invest \$50 million. And, also, we have invested money in other places, and we have worked with the shipyards and other sources of funding to continue to invest in the industrial base. We believe in a strong industrial base, and that is critical to our needs.

Admiral GILDAY. Ma'am, as I answer this question, I am going to speak more generally and not to Marinette in particular. I do think that those investments are important. However, I also think it is important to set expectations.

So, you mentioned, let's say, the Columbia class, which we will be building out to 2035, or Virginia class, which we are going to be building out to the late 2020s. So, when you have—when industry has that kind of set of headlights, as does Congress with respect to a commitment to building that many ships in a class for that long a period, I think it then becomes easier to justify those investments in private yard infrastructure.

And, so, I think that they should be tied together so we should not kid ourselves in terms of putting money down that we are not going to reap the benefits of.

Senator BALDWIN. Thank you.

Senator TESTER. Thank you, Senator Baldwin.

Senator MORAN.

Senator MORAN. Mr. Chairman, thank you.

General Berger, as you look to shift the Marine Corps' focus from counterinsurgency efforts to its original mission of naval expeditionary force, logistics will play a major role in the force structure. Your current CH-53E fleet continues to struggle with readiness issues, so I want to be certain the Marine Corps is prepared for a near-pier fight. Can you describe the new CH-53K heavy lift helicopter's contribution to your force structure redesign, particularly as it pertains to distributed maritime logistics in a contested environment?

General BERGER. I can, Senator. It is a phenomenal aircraft. I flew on that aircraft maybe 3 months ago, this past spring, down in North Carolina. Because growing up in 53Ds and 53Es, you kind of knew what that platform was like. I had not been on a 53K, other than in a simulator. Simulator does not do it justice. It is an incredible aircraft. Speed, lift capability, reliability, its fly-by-wire. He hovered and picked up a weight, hands off. I mean, it is that kind of technology. It is a glass cockpit. Now we just have to right-size it for what we need.

But, distributing the force the way the CNO and I have in mind, we are going to need the 53K. We are going to need the Light Amphibious Warship in order to move the troops and supplies and lethal aspects around. Critical.

Senator MORAN. How is this helicopter currently performing in preparation for the initial operation test and evaluation in July?

General BERGER. Probably like most programs, in the areas we look closest at, its performance, it is meeting the requirements. There are some areas where flight crews have suggestions on how to improve it, as you would expect. But, so far, on track, sir.

Senator MORAN. Great. Thank you for your answer.

General BERGER. Yes, sir.

Senator MORAN. Thank you for your service, all of you.

Senator TESTER. Thank you, Senator Moran.

We appreciate all of your testimony here today and the answers to the questions.

ADDITIONAL COMMITTEE QUESTIONS

Senators may submit additional written questions, and we ask you to respond to them within a reasonable amount of time.

[The following questions were not asked at the hearing, but were submitted to the Department for response subsequent to the hearing:]

QUESTIONS SUBMITTED TO HON. THOMAS W. HARKER

QUESTIONS SUBMITTED BY SENATOR RICHARD J. DURBIN

Question. Russia has built numerous Arctic bases and seems poised to bring very provocative nuclear weapons capable armaments—notably the Poseidon 2M39 torpedo—into the region that threaten us and our allies. Secretary of State Blinken recently raised the importance of keeping the Arctic a peaceful zone with his Russian counterpart and the Department of Defense says it reserves the right to conduct freedom of navigation exercises in the Arctic. But I remain concerned about Russia's aggressive moves in the region, particularly as the ice melts from climate change.

Please comment on the growing Russia presence and challenge in the Arctic.

Answer. The Arctic is a top priority for Russia as outlined in multiple Russian strategy documents. Russia is investing heavily to enhance its Arctic defense and economic sectors towards its northern flank. About 20 percent of Russia's land mass is north of the Arctic Circle. Russia aims to improve command and control, infrastructure, and joint force employment to project power and defend its northern approaches through modernized military capabilities and posture. The escalatory and non-transparent nature of Russia's military activity and unlawful regulation of maritime traffic along the Northern Sea Route undermines global interests, promotes instability, and ultimately degrades security in the region. Our strong relationships with Arctic allies and partners, further strengthened through exercises and U.S. presence in the High North and Arctic region, are our greatest strategic advantage strengthening our collective deterrent against these strategic challenges.

The Department of the Navy will work closely with interagency, international, and joint partners—especially the U.S. Coast Guard—while building new partnerships to protect the homeland, keep Arctic seas free and open, and deter coercive behavior and conventional aggression. Regional cooperation, built on a bedrock of internationally recognized principles like national sovereignty, is in the United States' interest and contributes to a secure and stable Arctic.

QUESTIONS SUBMITTED BY SENATOR RICHARD LEAHY

Question. Given the administration's priority of taking care of our people, and the important role that unit cohesion plays in improving readiness, it is crucial that the Navy take a fresh look at policies and practices that may not support all servicemembers. To that end, please outline what changes, if any, the Navy has made, is making, and plans to make, or is considering in order to:

Improve diversity in leadership positions;

Answer. Improving diversity in leadership positions compels the Department of the Navy (DON) to focus on diversity at all levels. Admiral Gilday meets routinely with his 17 Navy Community Leaders to discuss various community challenges to include the diversity demographics of each community, initiatives to support the re-

cruiting and retention of under-represented groups, the prevalence of destructive behaviors, and efforts to develop and retain future leaders.

Additionally, the Navy Junior Officer Counsel (NJOC) provides a formal link between Junior Officers and Senior Navy Leadership to provide feedback, ensuring we are doing everything we can to make our Junior Officers feel connected and included. The DON Diversity, Equity, and Inclusion (DE&I) lead will leverage feedback mechanisms and advisory groups similar to the NJOC to help advance DE&I initiatives.

The Marine Corps is focusing on areas where potential bias and discrimination could occur before a qualified officer reaches the selection or assignment board process. The assignment process and the performance evaluation system are areas where evaluation and selection are based on subjective analysis and where intentional or unintentional bias could occur. The Fitness Report Bias Study is an analysis that examines objectivity of the current performance appraisal process. The Basic School Military Occupational Specialty Assignment Study examines historical performance data, based on demographics, to evaluate the impact of performance on MOS assignment. The Marine Corps is also funding an independent study to identify and understand any barriers to advancement and retention of women and minorities in the Marine Corps.

Question. Improve diversity retention at all levels;

Answer. The Navy and Marine Corps are in line with the Office of the Secretary of Defense and the other Services in accomplishing the recommendations set out in the Secretary's Diversity and Inclusion Board Final Report.

Specifically, the Navy is currently implementing 56 recommendations from the Task Force One Navy (TF1N) final report. TF1N identified and made recommendations to dismantle barriers to equality while creating sustainable opportunities, ultimately achieving our desired end-state of warfighting excellence. In accordance with Secretary of Defense guidance, the Navy removed photographs during all Officer Selection and Command/Milestone Boards. Additionally, the Navy requires diverse representation on all boards and provides bias training to board members to be aware of their potential conscious and unconscious bias and ensure board fairness.

The Marine Corps DEI Strategic Plan will focus on recruiting and accessions, talent management, education, training, and commandership over the next 5 years. Independent studies are currently underway to better understand diversity and inclusion challenges and make improvements. The Marine Corps Outreach Program budget has increased from \$150,000 in fiscal year 2014 to \$1M in fiscal year 2021. The program provides opportunities for professional development, mentoring, and networking experiences by fully funding approximately 500 Marines to attend 19 national/regional conferences hosted by non-Federal entity affinity groups events throughout the year.

The various TF1N recommendations and initiatives found in the USMC DEI Strategic plan will be integrated into the DON DEI Implementation strategy to ensure ongoing efforts are sustained, measurable, possible to achieve, and specific enough to assess progress.

Question. Improve trainings, including sexual assault prevention, with input from women, LGBTQ servicemembers, BIPOC servicemembers, and sexual assault survivors;

Answer. The DON is committed to a culture of trust, respect, and inclusion that strengthens and promotes the resiliency and readiness of our force, our families, and our DON civilian workforce. Our DON DEI Team is working closely with the Services and stakeholders to update training and DEI competencies to incorporate the Navy's Culture of Excellence, USMC training frameworks and associated Signature Behaviors with input from DON and Service sexual assault prevention and response (SAPR) experts. The training uses adult learning theory best practices concerning small group-facilitated discussions. Once the training is in the pilot phase, we intend to solicit input from different populations of Sailors that may include specific groups such as women; LGBTQ+; black, Indigenous, and people of color (BIPOC); and sexual assault survivors.

The Marine Corps actively uses collaboration to address SAPR. They have collaborated with sexual assault survivors, members of the LGBTQ+ community, SAPR personnel, women, and BIPOC Service Members to improve SAPR training. The SAPR program works together with the other Services, DON and Department of Defense (DoD) SAPR Offices, and outside entities to enhance the ability to prevent and respond to sexual assault, identify best practices, and leverage resources. Training is tailored to specific levels of leadership. The Commander's Course better prepares senior leadership to prevent sexual assault once they assume command. Likewise, the First Sergeant's Course includes actionable recommendations for sexual assault

prevention, information on responses to trauma, and actions to take if a Marine is sexually assaulted.

In fiscal year 2021, the DON Sexual Assault, Sexual Harassment, and Suicide Prevention & Response Office led a robust revision of civilian training for DON, Marine Corps, and Navy personnel. Key revisions include a focus on early negative behaviors that increase risk for sexual assault (i.e., gender harassment, sexual harassment), skill-building to recognize negative behaviors and intervene, and the promotion of relevant response resources and programs (i.e., SAPR, Equal Opportunity, Employee Assistance Programs, etc.).

Revisions also include additional terminal learning objectives that focus on prevention, response, and supervisory skills related to the protection of populations at increased risk for harm. To protect civilians and Service member survivors or those who identify as LGBTQ+ and/or BIPOC, these objectives reinforce key concepts and skills.

Additional efforts to ensure culturally responsive trainings include Navy and Marine Corps Recruit Training updates that emphasize the knowledge and skills needed for healthy professional and personal relationships (i.e., trust, respect, inclusion, teamwork) and professional development webinars on the intersections between gender, race, sexual orientation, and sexual violence.

Question. Increase availability and accessibility of mental health support services for servicemembers and their families, including services tailored specifically toward minority servicemembers;

Answer. The Navy remains committed to promoting, maintaining and advancing a healthcare environment that adheres to the principles of community and equity by fostering principles that support: Care with Request; Excellence with Equity; Mindful Actions with Transparency, Responsibility, and Accountability; and Diversity with Inclusion.

Specific to mental health support services, the Navy and Marine Corps ascribes to a “no wrong door” policy to assist Marines, Sailors, and family members in getting help and support. This policy helps to facilitate access and decrease stigma in seeking mental health and substance misuse services. Services are available worldwide, including in specialty clinics, within primary care, at Navy and Marine Corps installation counseling centers, on the waterfront, and embedded within the fleet. Sailors and their families can also get mental health support, to include chaplains, Military and Family Life Counseling, Fleet and Family Support Centers, Marine Corps Community Services, and Military OneSource.

Within Navy Medicine, efforts are underway develop more formal structures for addressing and integrating health equity/disparities within the context of the Navy’s Diversity and Inclusion framework. This work includes collaboration with the Defense Health Agency and the other Services to advance access, equity, and opportunity among the healthcare staff, as well as to develop programs to ensure equitable care and treatment for all Service Members and families.

The Marine Corps’ focus is to treat all Service Members and their families with equality while recognizing and embracing diversity. Accessibility of nonmedical support services expanded in May 2020 to telephonic and virtual platforms.

Two significant support programs are the Unit Marine Awareness and Prevention Integrated Training for Marines (UMAPIT) and our Operational Stress Control and Readiness (OSCAR) programs. UMAPIT is a training and education calendar year requirement for all Marines and provides specific information and actions Marines can employ to access mental health resources. OSCAR is a Marine-trained team of Marines within Marine Corps units who help recognize and respond to stress. If a Marine believes their stress-level is negatively affecting their unit, an OSCAR member is there to talk and to connect the Marine with other resources.

Question. Improve outreach to and support for minority servicemembers facing discrimination from within their units;

Answer. DON policy is that each member of the team is entitled to be treated fairly, with dignity and respect, and must be allowed to work in an environment free of unlawful discrimination. The DON is committed to maintaining an inclusive work environment free from unlawful discriminatory practices and inappropriate behavior.

The Navy ensures all personnel are aware of the command and shore-based assistance available to those who need help in processing harassment or unlawful discrimination reports. In addition, the Navy identifies available counseling support or referral services for all personnel involved in incidents of harassment or unlawful discrimination. Follow-up debriefs are conducted with complainants no later than 45 days following the determination or resolution of harassment or unlawful discrimination report to determine the complainant’s satisfaction with the effectiveness of

the corrective action, timeliness, present command climate, and to ensure retaliation did not occur.

The Marine Corps takes a comprehensive approach to support minority Service Members facing discrimination within units. Combatting such behavior is a team effort that requires the commander to set the correct climate denouncing Prohibited Activities and Conduct (PAC) violations, Equal Opportunity Advisors/Equal Opportunity Representatives (EOAs/EORs) to educate and support the command and its unit members, and each unit member to be held accountable for their actions. The Marine Corps' support for minority Service Members facing discrimination within their units is rooted in the DoD's Strategic Elements of prevention, reporting, advocacy, education/training, and accountability; with MCO 5354.IF, "Prohibited Activities and Conduct Prevention and Response Policy." Marines complete PAC training every year, and commands can use their EOAs/EORs to conduct additional PAC training or focus groups, at any time, in order to combat PAC behavioral trends. The PAC order stipulates commanders must ensure Service Members have access to support services such as mental health counseling, medical, EOA, Victim and Witness Assistance Personnel, and Victim Legal Counsel.

Question. Improve medical care for transgender servicemembers, women, and Black parents, particularly for transition care, pregnancy, and post-partum care;

Answer. Navy Medicine is committed to ensuring all Sailors and Marines are treated with dignity and respect and have access to the highest quality healthcare in accordance with current evidence-based practice guidelines. We currently have two Navy Medicine interdisciplinary expert Regional Transgender Care Teams in place to support and improve the health and lives of transgender and gender non-binary Sailors and Marines. Our experts work closely with our Defense Health Agency, Army, and Air Force colleagues to ensure the incorporation of best clinical practices to support the medical readiness of our transgender and gender non-binary Sailors and Marines.

Navy Medicine continues to recognize and emphasize the importance of innovative pregnancy and postpartum care, resources, and educational materials for our Sailors and Marines to facilitate their return to duty. To recover in a healthy manner prior to being required to meet fitness and body composition standard, our updated Physical Readiness Program policies provide postpartum Sailors and Marines more time (i.e., 12 months vice nine months). We are also prioritizing the importance of ensuring our pregnant and postpartum Sailors and Marines have access to the support they need from a headquarters and a front line approach. Navy Medicine has developed a Postpartum Return to Duty Resource to provide Sailors and Marines with critical education on physical fitness, mental health, support services, and Navy and Marine Corps policies related to the postpartum transition to full duty. Within the military health system, our Navy Medicine women's health experts participate with the Defense Health Agency and the other Services. The focus is on women's health, perinatal practices, newborns, and infants, as well as a review of data and issues related to maternal and infant health care disparities, health equity, and social determinants of health, potentially impacted by race/ethnicity.

QUESTIONS SUBMITTED BY SENATOR DIANNE FEINSTEIN

Question. Secretary Harker, the 2017 Navy force structure assessment identified the need for three additional Expeditionary Sea Base ships. Congress included \$73 million in advance procurement funding for the eighth ship in fiscal year 2021. However, that eighth ESB ship was not in your latest long-range plan, and no additional funding is in your budget request. I am concerned that not building the eighth ESB will break critical supply chains for the main shipbuilder on the West Coast.

What operational risks are you accepting by not requesting ESB 8?

Answer. The current laydown plan will assign ESBs to the EUCOM/AFRICOM, CENTCOM, SOUTHCOM, and PACOM Areas of Responsibility. We assess minimal operational risk as five ESBs can provide presence in each of these theaters and can be re-allocated across theaters if necessary.

QUESTIONS SUBMITTED BY SENATOR SUSAN M. COLLINS

Question. I authored an amendment included as Section 121 in last year's NDAA, which required certifications and reports from the Navy if it intended to deviate below the Large Surface Combatants called for in the Navy's 2016 Force Structure Assessment. The fiscal year 2022 shipbuilding plan submitted to Congress proposes a significantly lower range of large surface combatants—between 63 and 65 ships.

However, in the Navy's report required by the NDAA, which the Committee received just 2 months ago, the Navy identified 78 large surface combatants as the best performing mix based on a 2019 analysis of alternatives. The Navy certified that a reduction of large surface combatants down from 104 could be mitigated due to having a reduced number of the Flight III's with the advanced AN/SPY-6 radar. The Navy also stated in its report that it did not expect any detrimental impacts to the industrial base based on current workload. But as we can see with the cut to the DDG-51 in this proposed budget, that workload seems anything but certain.

It seems that the Navy's report required by the NDAA was based on some incorrect or outdated assumptions regarding the number of large surface combatants the Navy planned to procure as well as the impact of this limited procurement on the industrial base. Will the Navy revisit this report?

Answer. To compete and win in an era of peer military competition, the United States needs a balanced naval force capable of striking targets in all domains. The force design must emphasize distributed awareness, lethality, and survivability in high-intensity conflict. The force must be adaptable, demonstrate presence, achieve sea control, and be capable of projecting power by delivering precision effects at long ranges. The Navy, working closely with the Office of the Secretary of Defense Director of Cost Assessment and Program Evaluation, continues to develop comparative assessments of naval force structure options consistent with Interim National Security Strategic Guidance and designed to maximize the maritime contribution to the joint force. The results of these efforts and ongoing experimentation and prototyping will be reflected in the fiscal year 2023 shipbuilding plan.

The Department is conducting analysis to refine understanding of the readiness and performance of the fleet against a future near-peer competitor capable of global operations. Furthermore, the Navy continues to evaluate the industrial base pivot points required to support future platform development and the industrial base development needed for these future planned platforms, such as the next generation attack submarine and the future large surface combatant, including land-based testing to enable success in these future programs. A complete 30-year shipbuilding plan will be submitted with the President's Budget for fiscal year 2023. The Navy does not plan to submit a separate Report to Congress on Large Surface Combatants and AN/SPY-6 in fiscal year 2023.

QUESTIONS SUBMITTED BY SENATOR LISA MURKOWSKI

INTELLIGENCE, SURVEILLANCE, AND RECONNAISSANCE OSR IN THE ARCTIC REGION

Question. Fonner Coast Guard Commandant Admiral Zukunft, a fellow maritime service chief relayed an alarming anecdote last fall saying, "We have significant domain awareness challenges, and that really begins in the high latitudes." Things start to get pretty dark once you get up higher than 72 degrees north." He went on to discuss the Coast Guard stumbling upon a joint Chinese and Russian exercise in the region without any prior knowledge from our intelligence assets.

And, just last August, a Russian military exercise in our own Exclusive Economic Zone, just off the coast of Alaska, spooked a fleet of our own fishennan out of our own waters—waters that they have every right to be in and cost them millions of dollars in lost catch and equipment.

Secretary Harker, does this budget include capabilities for our naval services that will increase our domain awareness in the Arctic?

Does this budget provide you the ability to operate in the High North whenever called upon and with the proper resources to be effective?

Answer. While the budget does not include investments on ISR specifically focused on the Arctic, it does continue the pattern of equipping our Navy's globally deployable ships, submarines, and aircraft with the ISR capabilities needed to contribute to domain awareness whenever and wherever we operate. It also positions our Naval Forces, through its acquisition programs and Naval Intelligence arm, to maintain strong relationships with the IC. That long-standing relationship sets conditions for us to not only influence the development of IC capabilities but to secure the advantages that come from being able to access those capabilities to advance our worldwide military mission in this era of renewed strategic competition at sea.

ARCTIC STRATEGY

Question. As an Alaskan, I am well aware and proud of our nation's history in the Arctic, but, frankly, I'm focused on the now. With that in mind, your strategy, "Blue Arctic" specifically states "The [Navy] will be postured to deter aggressive and malign behavior, keep the seas free and open, and assure allies and partners of our

long-term commitment to preserving peace and advancing shared interests.” It also emphasizes the need for “credible naval forces [to] ensure the ability to deter competitors and rapidly respond to crises in the region.

Secretary Harker are we postured right now, at this very moment, to deter aggressive and malign behavior in the Arctic? Having the Russians chase off an American fishing fleet or stumbling upon a joint Chinese/Russia exercise doesn’t sound like we’re quite there yet.

Can you discuss how in your proposed budget you are acquiring the means to do so in the future?

Answer. The Arctic is a top priority for Russia as outlined in multiple Russian strategy documents. Russia is investing heavily to enhance its Arctic defense and economic sectors towards its northern flank. About 20 percent of Russia’s and mass is north of the Arctic Circle. Russia aims to improve command and control, infrastructure, and joint force employment to project power and defend its northern approaches through modernized military capabilities and posture. The escalatory and non-transparent nature of Russia’s military activity and unlawful regulation of maritime traffic along the Northern Sea Route undermines global interests, promotes instability, and ultimately degrades security in the region. Our strong relationships with Arctic allies and partners, further strengthened through exercises and U.S. presence in the High North and Arctic region, are our greatest strategic advantage strengthening our collective deterrent against these strategic challenges.

The Department of the Navy will work closely with interagency, international, and joint partners—especially the U.S. Coast Guard—while building new partnerships to protect the homeland, keep Arctic seas free and open, and deter coercive behavior and conventional aggression. Regional cooperation, built on a bedrock of internationally recognized principles like national sovereignty, is in the United States’ interest and contributes to a secure and stable Arctic.

ICEBREAKERS

Question. I have a growing concern with the lack of icebreakers and even ice-hardened surface ships in our fleet to carry out the strategic deterrence that you have identified as necessary in the Navy’s strategy and the use of icebreakers for other purposes. I have long advocated for the procurement of icebreakers and I’m glad we’re making some progress in building some for the Coast Guard, but those are still a long ways away from being sea ready. As it pertains to icebreakers, my number one priority is building them here. My second priority is getting this capability in our hands as soon as possible.

The previous administrations was in discussions about leasing icebreakers through the Navy. To be clear, I am not advocating for leasing instead of building our own, but being cognizant of the fact that we need this capability now, are you doing anything to acquire ice breaking capabilities to bridge the gap between now and when we field new ones ourselves? As your strategy, “Blue Arctic” mentions six times, how the Navy will address issues in the “decades ahead,” but current events illustrate they are needed now. If not icebreakers, are other mechanisms being put in place to overcome this shortfall?

Answer. Icebreaking remains a core U.S. Coast Guard mission. The Navy continues to provide acquisition assistance to the Coast Guard to ensure the Polar Security Cutter meets the demands of the Nation.

Question. Mr. Secretary, your Arctic strategy also states, “Naval forces will work in concert with interagency efforts and ensure our planning efforts are integrated with local, state, Federal, and indigenous communities. Native Alaskan tribes have a long and honorable history of military service that blend seamlessly with such efforts.” Can you discuss these efforts to date, or are they forthcoming? Do you have a timeline or plan for when this coordination will begin? Who in your department has been given the lead for these efforts?

Answer. While the Arctic largely remains a region of cooperation, continuing changes in the physical environment, increased military activity, and efforts by non-Arctic nations to restructure Arctic governance require continual assessment of the region. The Department of the Navy’s (DON) priorities in the Arctic Blueprint include working closely with our partners and allies as well as with interagency partners. As we look to strengthen interagency efforts, the DON is developing its implementation approach to ensure alignment with the 2022 National Defense Strategy and the Secretary of the Navy’s strategic vision. In addition to preserving economic prosperity and keeping the seas open and free, the DON remains fully committed to safeguarding the homeland and protecting our national security. While the DON requires more time to consider specific details of implementation and coordination, the Arctic region remains of significant importance to the DON mission. The Imple-

mentation Plan will be tailored to meet the demands of the Arctic region, to include the integration of planning efforts with local, state, and Federal entities, and with indigenous communities. Additionally, we will have an opportunity to better align the DON's objectives with the impending release of the National Security Council's National Arctic Strategy.

UNITED NATIONS CONVENTION LAW OF THE SEA

Question. At a recent budget-hearing for the State Department, Secretary Blinken told me that, by his own determination, and I quote: "the United States would be extremely well served by ratifying the Law of the Sea Treaty." He even went as far as to say that this is not only his opinion, but "it's been the judgement across the board by our military leadership, uniform and civilian for many years." Secretary Blinken is the latest in a long line of department secretaries to agree on this point. I believe that ratifying the Law of the Sea is in the best interest of the United States. Along with Senator Hirono, I put forward legislation urging the Senate to ratify Law of Sea.

Mr. Secretary, do you believe the Senate should ratify the Law of Sea?

Answer. The Convention reflects customary international law on which the United States has long relied for its freedoms of navigation and overflight around the world. Acceding to the Convention would reinforce these rights and freedoms and could place the United States in a stronger position when challenging violations of international law by our adversaries.

Question. What benefit will it provide to the United States? Would we be in a stronger military position if we were to ratify the Law of the Sea?

Answer. The Convention sets forth navigational rights and freedoms across the globe for civilian and military ships and aircraft that are vital to our national security, including innocent passage through territorial seas and transit passage through, under, and over international straits. The United States must currently rely on customary international law as the legal authority for these and other provisions, which does not adequately protect U.S. maritime security interests over the long term. Becoming a party to the Convention would solidify these and other rights and freedoms in a manner beneficial to naval operation, facilitate closer cooperation with our allies and partners, and silence the claims of some nations that say only member states may enjoy the freedoms the Convention provides. In other words, joining the Convention is the best means of placing our rights and freedoms on a secure footing and maximizing the ability of our armed forces to move through and over the world's ocean waters.

In addition, the Navy's maritime strategy and daily operations are heavily based on the navigational rights enumerated in the Convention. Both current and future operations contemplate operating with allies and partners—all of whom are parties to the Convention. Acceding to the Convention enables U.S. leadership and influence in the shaping of global maritime law and policy in ways that facilitate U.S. interests, lends legitimacy to U.S. maritime activities, and demonstrates U.S. commitment to the rule of law in the conduct of its operations.

Question. And what would you say to those that want to be tough on China and Russia, but are still against the ratification of the treaty?

Answer. The law of the sea is continuously being interpreted, applied, and developed. Accession to the Convention would give the United States a seat at the table to set the course for future law of the sea discussions on a co-equal level with China and Russia, who are member states. China portrays an increasingly aggressive posture in the South China Sea, attacking the international rules-based order embodied by the Convention through gray zone activities that seek to erode its provisions. As a party, U.S. objections to these violations would have significantly more force and credibility.

QUESTIONS SUBMITTED BY SENATOR ROY BLUNT

NO FISCAL YEAR 2022 FUNDING FOR F/A-18 SUPER HORNET PRODUCTION

Question. Secretary Harker, I acknowledge that in this tough budget cycle, difficult choices must be made. I appreciate your efforts toward finding efficiencies, for reducing our reliance on legacy systems and for placing an emphasis both on our people first and on critical efforts to modernize for the future fight. However, I think we need to be mindful of building a sound bridge to future capabilities that also maintains and safeguards our readiness for today's fight.

The F/A-18 is presently the backbone of the Navy's carrier air wing. While I appreciate a forward-looking focus with the Next Generation Air Dominance (NGAD)

program, as I understand it, NGAD will not provide a successor to the Super Hornet until 2030, at the very earliest. I'm concerned that if we end Super Hornet production prematurely, simply relying upon Service Life Modification (SLM) upgrades to get our fleet to Block III-capable is not a sound bridging solution, particularly when the SLM process is already falling behind schedule.

When the Block III program began in 2018–2019, the Navy planned to have 20 Block III-capable Super Hornet squadrons by 2027. But currently, 67 Block II aircraft that were meant to be upgraded between 2018 and 2023 are already pushed back to at least 2024.

If we combine this SLM slow down with no funding for additional Super Hornets this year or next, the Navy is ultimately short 103 Block III-capable Super Hornets that you initially planned to have by 2027. We then have three more years, at a minimum, before the Next Generation Air Dominance Program produces results that we can operationally employ.

My question for you, Secretary Harker, is can you help me understand this modified bridging strategy to the next generation of our carrier's air wing? Would it not make more sense to continue with the original Super Hornet transition plan—to continue the production line for several more years while working Block III modifications—to achieve the necessary inventory levels of the most capable tactical fighter in the Navy's current inventory until a successor is ready?

Answer. To ensure the Navy has the advanced capabilities required to compete with peer adversaries in the 2020s and 2030s, continued investments in the procurement of new F–35C and the Next Generation Air Dominance Family of Systems (NGAD FoS) are necessary. Given the ongoing delivery of new procurement Block III F/A–18E/F, new procurement F–35C, and Service Life Modification (SLM) to extend the life and capability of existing F/A–18E/F Block II aircraft, strike-fighter shortfall (SFSF) is projected to be eliminated by 2025. Additional procurement of new F/A–18E/F Block III aircraft beyond fiscal year 2021 is not required to mitigate near- or long-term SFSF risk. The Navy assesses that new F/A–18E/F procurement beyond fiscal year 2021 would arrive late-to-need to address near-term SFSF challenges—which are actively being managed- and excess-to-need for fourth generation aircraft capacity to meet the demands of the National Defense Strategy.

NAVPLAN 2021 prioritizes development of capabilities to enable a more lethal and better connected fleet that can outpace the growing Chinese threat. New F/A–18E/Fs delivered in fiscal year 2026 will have the service life (10K Flight Hours) to operate well into the 2050s. Current analysis shows the F/A–18E/F is insufficient to meet the Long Range Fires requirement against peer threats in the 2030s, even when partnered with F–35C. Engineering Change Proposals (ECPs) for BLKIII that were anticipated to increase range never came to fruition. The remaining ECPs do increase capability as a stop-gap in the short-term, however further procurement of F/A–18E/F at the expense of future capability will directly inhibit the Navy's ability to fight and win in the Great Power Competition. Procurement of F–35C and SLM remain our best levers to manage Strike Fighter capacity until NGAD FoS comes online.

The Navy is on track to meet the Super Hornet Block III supply requirements demanded by the Master Aviation Plan 20–02 (MAP 20–02). Block III capacity is being delivered through new procurement and upgrading Block II aircraft to Block III capabilities through SLM beginning in Quarter 4 (Q4) fiscal year 2022. Through 2027, Boeing will deliver 78 new Block III aircraft (fiscal year 2021 through fiscal year 2025), and 119 SLM Block III aircraft to meet our Carrier Air Wing requirements.

Today we have 436 BLK II aircraft. Due to fiscal constraints, we are not currently maximizing Boeing's advertised SLM conversion capacity. We have the inventory and capacity to meter SLM output as required in the future.

The flyaway cost for a new Block III F/A–18E/F is \$69 million in calendar year 2020. Block III modifications required to convert a Block II aircraft is currently estimated at \$9 million. Adding Block III modification costs to SLM establishes an estimated cost of \$18–\$23 million per aircraft. A cost range was required due to multiple aircraft configurations of the F/A–18E/F fleet, all of which require different configurations and modifications. Current estimates show that three SLM aircraft can be upgraded to Block III configuration for the same cost as one brand new aircraft, without impacting Strike Fighter Inventory Management (SFIM).

Though there have been unanticipated delays in the early phase of SLM, Boeing is confident it can meet the projected SLM turnaround and delivery times for Block III aircraft. While there is risk inherent in the analysis and projections, there are currently several risk mitigation actions underway by both Boeing and the Navy to ensure the Carrier Air Wings will have enough Block III aircraft to meet operational requirements.

SLM has two phases of execution. Phase 1 is the planned 'crawl and 'walk' phases of SLM which is only a flight hour extension of Block II aircraft from 6000 to 7500 flight hours and does not include Block III capabilities. Phase 1 has experienced unanticipated challenges with the material condition of early aircraft inductions, which has driven a significant increase to SLM workload, staffing gaps, slower learning, significant cost overruns, and schedule delay. In response to these challenges, both Boeing and the Navy have implemented mitigation strategies. Boeing has surged staff at both SLM locations (St Louis, MO, and San Antonio, TX) and has initiated early detection teams for common material condition cost/schedule drivers with a feedback loop to Navy fleet. The Navy has commenced pre-SLM grooming to address known material condition prior to SLM induction and established improved corrosion prevention practices. A total of 49 aircraft will receive SLM phase 1 and will complete in Q4 fiscal year 2022.

SLM Phase 2 is the full Block III upgrade to 10,000 flight hours and the same capabilities as new production aircraft. Phase 2 is expected to commence in Q4 fiscal year 2022 with Boeing advertised turnaround time (TAT) per aircraft inducted of 12 months. The SLM program has seen steady improvement to cost and schedule since mitigations were implemented, and Boeing is confident they can achieve the 12-month TAT for SLM phase 2. As part of the Navy's SFIM planning, the Navy has determined that the MAP 20-02 demand can be met with up to an 18-month TAT. Even if some of the SLM phase 1 complications were to continue into phase 2, there will be minimal to no effect to the Block III capacity to meet the MAP20-02 demand.

The SLM of existing F/A-18E/F aircraft, combined with an active F-35C production line, are the two risk mitigations in place for the Navy to manage total strike-fighter inventory. The total number of SLM aircraft conversions will depend on the timeline for the NGAD FoS initial operational capability and full operational capability in the 2030s. The Navy will continue to SLM aircraft at a rate commensurate with capacity requirements, with an option to SLM all current Block II F/A-18E/F aircraft if deemed necessary.

QUESTIONS SUBMITTED BY SENATOR JOHN HOEVEN

Question. I am a strong supporter of our nuclear deterrent, not only the two legs of the triad located at Minot Air Force Base with our B-52s and the Minuteman III ICBMs, but also the submarine based leg of the triad. You've stated that the *Columbia*-class submarine, which will replace the aging Ohio class, is the Navy's top procurement priority, but of course, you also have to ensure that the D5 Trident, which is the ballistic missile carried by our boomers, is ready and reliable when the *Columbia*-class boats enter the fleet.

Could you describe the basic plan to modernize the Trident missiles and whether there is any coordination with the Air Force's effort to modernize our land-based ICBMs?

Answer. The Navy is committed to ensuring that the transition between *Ohio*-class and *Columbia*-class submarines stays on schedule. This includes a seamless transition of the current TRIDENT II D5 Life Extension (D5LE) weapon system and missile inventory on to the new *Columbia*-class. To be clear, the D5LE weapon system currently deployed on *Ohio*-class will be the same weapon system deployed on the first eight hulls of the *Columbia*-class. To ensure the Navy has missiles for *Columbia* Hull 9 and able to replace the missiles on the first eight hulls when the missiles' safety-related components expire, it is imperative that we start the work on a future missile and corresponding weapons system now. This next generation of the current OSLE missile—a missile in service since 1989 and boasting a remarkable history of 182 successful flight tests—is called D5 Life Extension 2 (D5LE2). Several areas of the industrial base will have to be reconstituted as suppliers of critical obsolete components have gone out of business or shifted production to other fields. D5LE2 will primarily safely extend the D5 strategic weapons system, but this industrial base reconstitution coupled with improved manufacturing processes also provides the opportunity to build in flexibility that will ensure that TRIDENT remains credible in the face of a dynamic threat environment throughout the *Columbia*-class service life. D5LE2 must be developed, tested, and produced with the lead-time sufficient to deploy 16 missiles on *Columbia* Hull 9 in fiscal year 2039.

The Navy works closely with the Air Force and Missile Defense Agency (MDA) through a Flag Level 2018 Memorandum of Understanding (MOU) that governs the collaboration of strategic ballistic missile systems. The efforts established by this MOU enable affordability by avoiding redundant efforts (e.g., Radiation Hardened Electronics Testing and Flight Testing Instrumentation), advance capability by

sharing and leap frogging technology (e.g., Strategic Grade Inertial Measuring Units), and reduce risks across programs via industrial base collaboration (e.g., Solid Rocket Motor Production). With similar technical challenges and a joint industrial base, the Navy fully recognizes the importance of collaborating with both the Air Force and MDA while simultaneously sustaining and modernizing our strategic ballistic missile systems.

QUESTIONS SUBMITTED TO ADMIRAL MICHAEL GILDAY

QUESTIONS SUBMITTED BY SENATOR PATRICK LEAHY

Question. Given the administration's priority of taking care of our people, and the important role that unit cohesion plays in improving readiness, it's crucial that the Navy take a fresh look at policies and practices that may not support all servicemembers. To that end, please outline what changes, if any, the Navy has made, is making, plans to make, or is considering in order to:

Improve diversity in leadership positions;

Answer. Navy has implemented numerous initiatives to improve diverse representation in leadership positions and is currently implementing recommendations from the Task Force One Navy (TF1N) final report. TF1N was established to identify and make recommendations to dismantle barriers to equality while creating sustainable opportunities, ultimately achieving our desired end-state of warfighting excellence. Following the TF1N final report, Navy removed photographs during all Officer Selection and Command/Milestone Boards. Additionally, Navy requires diverse representation on all boards and provides bias training to board members to be aware of their potential conscious and unconscious bias and ensure board fairness.

Question. Improve diversity retention at all levels;

Answer. To improve diversity retention, I meet routinely with our 17 Navy Community Leaders, all flag officers, to discuss various community challenges to include the diversity demographics of each community, initiatives to support the recruiting and retention of under-represented groups, the prevalence of destructive behaviors, and efforts to develop and retain future leaders. We conduct listening sessions around the Fleet to ensure all voices are heard and that Sailors and civilian employees understand their opinions matter and are taken into account by command leadership. Additionally, the Navy Junior Officer Counsel formed a formal link between Junior Officers and Senior Navy Leadership to provide feedback, ensuring we are doing everything we can to make our Junior Officers feel connected and included. Though Navy has more work to do to reduce and eliminate barriers to upward career trajectory based on race, gender, ethnicity, or socio-cultural background, we are encouraged by our team's progress.

Question. Improve trainings, including sexual assault prevention, with input from women, LGBTQ servicemembers, BIPOC servicemembers, and sexual assault survivors;

Answer. Our training is being updated to incorporate the Navy's Culture of Excellence and associated Signature Behaviors with input from our sexual assault prevention and response team. Adult learning theory best practices concerning small-group, facilitated discussions will be also be used throughout the training. Once the training is in the pilot phase, we intend to solicit input from different populations of Sailors that may include specific groups such as women, LGBTQ, BIPOC, and sexual assault survivors.

Question. Increase availability and accessibility of mental health support services for servicemembers and their families, including services tailored specifically toward minority servicemembers;

Answer. Senator Leahy, I want to assure you that the Navy remains committed to promoting, maintaining and advancing a healthcare environment which adheres to the principles of community and equity by fostering principles that support: Care with Request; Excellence with Equity; Mindful Actions with Transparency, Responsibility and Accountability; and Diversity with Inclusion.

Specific to mental health support services, Navy ascribes to a "no wrong door" policy to assist Sailors and family members in getting help and support. This policy helps to facilitate access and decrease stigma in seeking mental health and substance misuse services. Services are available worldwide, including in specialty clinics, within primary care, at Navy installation counseling centers, on the waterfront, and embedded within the Fleet. Sailors and their families can also get mental health support, to include chaplains, Military and Family Life Counseling, Fleet and Family Support Centers, and Military OneSource.

Within Navy Medicine efforts are underway develop more formal structures for addressing and integrating health equity/disparities within the context of the Navy's Diversity and Inclusion Framework. This work includes collaboration with the Defense Health Agency and the other Services to advance access, equity and opportunity amongst the healthcare staff as well as develop programs to ensure equitable care and treatment for all service members and families.

Question. Improve outreach to and support for minority servicemembers facing discrimination from within their units;

Answer. Navy ensures all personnel are aware of the command and shore-based assistance available to those who need help in processing harassment or unlawful discrimination reports. In addition, Navy identifies available counseling support or referral services for all personnel involved in incidents of harassment or unlawful discrimination.

Follow-up debriefs are conducted with complainants no later than 45 days following the determination or resolution of harassment or unlawful discrimination report to determine the complainant's satisfaction with the effectiveness of the corrective action, timeliness, present command climate, and to ensure retaliation did not occur.

Question. Improve medical care for transgender servicemembers, women, and Black parents, particularly for transition care, pregnancy, and post-partum care;

Answer. Navy is committed to ensuring all Sailors are treated with dignity and respect and have access to the highest quality healthcare in accordance with current evidence-based practice guidelines. We currently have two Navy Medicine interdisciplinary expert Regional Transgender Care Teams in place to support and improve the health and lives of transgender and gender non-binary Sailors. Our experts work closely with Defense Health Agency and our Army and Air Force colleagues to ensure we incorporate best clinical practices in support of the medical readiness of our transgender and gender non-binary Sailors.

We continue to recognize and emphasize the importance of innovative pregnancy and postpartum care, resources, and educational materials for our Sailors to facilitate their return to duty. Our updated Physical Readiness Program policy provides postpartum Sailors more time, 12 months vice 9 months, to fully recover in a healthy manner prior to being required to meet fitness and body composition standards. We are also prioritizing the importance of ensuring our pregnant and postpartum Sailors have access to the support they need. Navy Medicine has developed a Postpartum Return to Duty Resource to provide Sailors with critical education on physical fitness, mental health, support services, and Navy and Marine Corps policies related to the postpartum transition to full duty. Within the Military Health System, our Navy Medicine women's health experts participate with the Defense Health Agency and the other Services on lines of efforts focused on women's health, perinatal practices, newborn and infants as well as review of data and issues related to maternal and infant healthcare disparities, health equity, and social determinants of health which may be impacted by race/ethnicity.

QUESTIONS SUBMITTED TO GENERAL DAVID H. BERGER

QUESTIONS SUBMITTED BY SENATOR PATRICK LEAHY

Question. Given the administration's priority of taking care of our people, and the important role that unit cohesion plays in improving readiness, it's crucial that the Marine Corps take a fresh look at policies and practices that may not support all service members. To that end, please outline what changes, if any, the Marine Corps has made, is making, plans to make, or is considering in order to:

Improve diversity in leadership positions;

Answer. Diversity and inclusion are force multipliers and take advantage of the wide array of experiences and perspectives necessary to maintain our current and future warfighting excellence. We are committed to capitalizing on the knowledge, skills, abilities, performance, and potential of every Marine.

Diversity in the Marine Corps is increasing. Since 2009, diverse enlisted accessions have increased from 34 percent to 43 percent, and diverse officer accessions have increased from 16 percent to 35 percent. Women officer accessions have increased from 8 percent to 13.8 percent during this same time period. Women represented in previously restricted military occupational specialties (MOS's) are also on the rise. Last year, 737 women were in previously restricted units; that number is now 1,101. Similarly, 283 women were serving in previously restricted MOS's; today that number is 415, including the first woman Reconnaissance Marine.

This year, the Marine Corps reached the level of 21 percent in diversity for Brigadier Generals and Brigadier General-selects, the highest level of diverse representation at that rank in Marine Corps history. And by the end of July of this year, two minority officers from that cohort will promote to Major General. We look forward to seeing this trend continue.

The Marine Corps is a full partner with the Office of the Secretary of Defense and the other Services in accomplishing the recommendations set out in the Secretary's Diversity and Inclusion Board Final Report. However, the Marine Corps is also taking its own initiative to both study and make changes to continue to improve diversity and inclusion.

First, our Diversity, Equity, and Inclusion Strategic Plan will guide our actions over the next 5 years in the areas of recruiting and accessions, talent management, education, training, and commandership. It provides a framework to align a number of efforts, identify new initiatives, and provide oversight across the Corps for implementation by commanders at every level. One of our first actions to implement our plan was the appointment of a general officer as the Service's Chief Diversity and Inclusion Officer. This position will communicate program goals, develop policy, and action per the aforementioned strategic plan. Concurrently, the Marine Corps bolstered the Diversity, Equity, and Inclusion Review Board (DRB). The DRB serves as the action arm of the Marine Corps Diversity and Inclusion Management Program to address diversity, inclusion, and command climate issues that may affect the Marine Corps.

Second, a host of independent studies are currently underway to better understand diversity and inclusion challenges and make improvements. Our Fitness Report Bias Study is an analysis which is examining the objectivity of the current performance appraisal process. The Basic School Military Occupational Specialty Assignment Study which will examine historical performance data, based on demographics, to evaluate the impact of performance on MOS assignment. We are also funding an independent study to identify and understand any barriers to advancement and retention of women and minorities in the Marine Corps. Finally, our Exit & Milestone Longitudinal Survey provides feedback to better understand personnel satisfaction regarding career opportunities, leadership, performance management, diversity, and work-life programs.

Outreach and external engagement are an important facet of our holistic approach to diversity and inclusion. We have steadily increased our Outreach Program budget from \$150,000 in fiscal year 2014 to \$1 million in fiscal year 2021. This Program provides opportunities for professional development, mentoring, and networking experiences by fully funding approximately 500 Marines to attend 19 national/regional conferences hosted by non-Federal entity affinity groups events throughout the year.

The Marine Corps is working collaboratively with our training command to incorporate unconscious bias training at every rank throughout the training continuum. Diversity of thought and experience that each Marine brings will help us find more creative and innovative solutions to these future challenges.

Diversity and inclusion are, more than anything, a leadership issue. Marine leaders must not just talk about changing culture—they must be the example of how to treat fellow Marines and all individuals with dignity, respect, empathy and compassion.

Question. Improve diversity retention at all levels;

Answer. See response to 1a above.

Question. Improve trainings, including sexual assault prevention, with input from women, LGBTQ servicemembers, BIPOC servicemembers, and sexual assault survivors;

Answer. Collaboration is key in addressing sexual assault prevention and response. We have collaborated with sexual assault survivors, members of the LGBTQ+ community, SAPR personnel, women, and BIPOC servicemembers to improve our SAPR training; we will continue to do so. Our SAPR program works together with the other Services, Department of the Navy and Department of Defense Sexual Assault Prevention and Response Offices, and outside entities to enhance our ability to prevent and respond to sexual assault, identify best practices, and leverage resources.

Our continued focus on prevention seeks to tailor training to specific levels of leadership. This enables a multi-layered approach to prevention to fit Marines of every age, rank, and billet. For example, our updated SAPR annual training for Staff Non-Commissioned Officers (SNCO) provides more focus at the small unit level. This training's goal is to help increase SNCO knowledge about sexual assault, reporting, resources, rank-specific roles and responsibilities, and to build skills consistent with primary prevention.

We also updated the SAPR training for the Commander's Course to better prepare senior leadership to prevent sexual assault once they assume command. This includes information focused on actionable recommendations for pre-command leaders and small group discussions facilitated by Marine Corps mentors and SAPR experts. Commanders set the tone of their unit—we know how important it is to ensure they are equipped before they assume command to establish the right command climate—a climate that encourages Marines to look out for one another and report destructive behaviors and crimes, and that mandates accountability for perpetrators and enablers. Likewise, we updated First Sergeant's Course to include actionable recommendations for sexual assault prevention, information on responses to trauma, and actions to take if one of their Marines is sexually assaulted, appropriate to their new positions.

While we highlight our prevention efforts, we acknowledge that we are not where we need to be; we still have incidents of sexual harassment and assault and so we must ensure we provide the best support possible to victims. A revised SAPR Victim Advocate (VA) training was released in October 2019 and has been fully implemented. The revised 40-hour curriculum focuses on building and refining advocacy skills and includes cultural competency and prevention training. We are currently revising Sexual Assault Response Coordinator (SARC) Initial Training to build on advocacy and cultural competency skills taught in the 40-hour training and prepare SARCs to oversee their SAPR program.

The Marine Corps continually evaluates SAPR initiatives for effectiveness by conducting needs assessments, surveys, and staffing analysis. SARC and VA training curriculum development has been standardized which better ensures that Marines understand reporting options, SARCs and VAs are prepared to support victims, and all understand their role in sexual assault prevention.

We want to leverage technological developments too. We are implementing online evaluation tools for select SAPR annual training, Victim Advocate training, and Sexual Assault Response Coordinators initial training. The evaluation tools measure changes in knowledge, attitudes, and intentions, as well as training satisfaction, consistency of instruction, and quality of instruction. These evaluation results will inform local SAPR personnel, as well as HQMC personnel, on the effectiveness of the trainings.

Question. Increase availability and accessibility of mental health support services for servicemembers and their families, including services tailored specifically toward minority servicemembers;

Answer. Marine Corps' focus is to treat all Service member and their families with equality while recognizing and embracing diversity. Accessibility of nonmedical support services was expanded in May 2020 to telephonic and virtual platforms. Traditional knee-cap to knee-cap counseling remained intact whenever possible as well. Although each installation across the Marine Corps provides published service hours, standard practice from the field staff in the behavioral health programs is to accommodate alternate hours upon request.

Two significant support programs are the Unit Marine Awareness and Prevention Integrated Training for Marines (UMAPIT) and our Operational Stress Control and Readiness (OSCAR) programs. UMAPIT is a training and education calendar year requirement for all Marines, and provides specific information and actions Marines can employ to access mental health resources. OSCAR is a Marine-trained team of Marines within Marine Corps units who help recognize and respond to stress. If a Marine believes their stress-level is negatively impacting their unit, an OSCAR member is there to talk and to connect the Marine with other resources. These and other programs are specifically geared to nonmedical mental health support.

The Marine Corps remains committed to promoting, maintaining, and advancing a healthcare environment that adheres to the principles of community and equity by fostering principles that support: Care with Request; Excellence with Equity; Mindful Actions with Transparency, Responsibility and Accountability; and Diversity with Inclusion.

Specific to mental health support services, the Marine Corps ascribes to a "no wrong door" policy to assist Marines and family members in getting help and support. This policy helps to facilitate access and decrease stigma in seeking mental health and substance misuse services. These services are available worldwide, including in specialty clinics, within primary care, at Marine Corps installation counseling centers, and embedded within the Fleet Marine Force.

Marines and their families can also get mental health support, to include chaplains, Military and Family Life Counseling, Marine & Family Programs, and Military OneSource.

Within Navy Medicine, efforts are underway to develop more formal structures for addressing and integrating health equity/disparities within the context of the De-

partment of the Navy's Diversity and Inclusion Strategic Framework. This work includes collaboration with the Defense Health Agency and the other Services to advance access, equity, and opportunity amongst the healthcare staff; as well as develop programs to ensure equitable care and treatment for all service members and families.

Question. Improve outreach to and support for minority servicemembers facing discrimination from within their units;

Answer. The Marine Corps' support for minority service members facing discrimination within their units is rooted in the DoD's Strategic Elements of prevention, reporting, advocacy, education/training, and accountability; with Marine Corps Order (MCO) 5354.1F, "Prohibited Activities and Conduct (PAC) Prevention and Response Policy," encompassing all of the aforementioned elements of support.

Our PAC order defines that any conduct discriminating an individual or a group based on race, color, national origin, religion, sex (including pregnancy), gender identity, or sexual orientation is prohibited by all personnel. The order describes how qualitative and quantitative data collection from Command Climate Assessments (CCAs) allows commands to best leverage command-level Equal Opportunity Advisors/Equal Opportunity Representatives (EOAs/EORs) to facilitate focus groups and tailor annual PAC training to include additional topics, as part of a comprehensive prevention strategy.

Not only do all Marines complete PAC training every year, commands can use their EOAs/EORs to conduct additional PAC training or focus groups, at any time, in order to combat PAC behavioral trends.

As an additional part of CCAs, any areas falling below the average require a corrective action plan by the commander. The plan is implemented and evaluated during all Comprehensive Command Inspections, Independent Command Inspections, and the Commanding General's Inspection Program Inspections as an additional level of validation by external command entities. The commander is appropriately held further accountable on his/her annual fitness report by a statement identifying a commander's failure, if any, to conduct required CCAs.

Annual PAC training also informs unit members that any complaints of violating behaviors they witness can be reported for command resolution. The complaint will then be resolved through informal or formal resolution. All unit members have access to full-time EOAs and collateral-duty EORs, who provide advice and guidance to complainants on matters related to PAC. Typically, EOAs/EORs provide the annual training and conduct focus groups, so unit members know who these appointed personnel are, but each command also posts fliers identifying these personnel in an effort to ensure service members have this information at all times.

Additionally, the PAC order stipulates commanders must ensure Service members have access to support services, such as mental health counseling, medical, EOA, Victim and Witness Assistance Personnel, and Victim Legal Counsel.

The Marine Corps takes a comprehensive approach to support minority service members facing discrimination within units. Combatting such behavior is a team effort that requires the commander to set the correct climate denouncing PAC violations, EOAs/EORs educate and support the command and its unit members, and each unit member being held appropriately accountable for their actions.

Question. Improve medical care for transgender servicemembers, women, and Black parents, particularly for transition care, pregnancy, and post-partum care;

Answer. The Marine Corps is committed to ensuring all Marines are treated with dignity and respect, along with access to the highest quality healthcare in accordance with current evidence-based practice guidelines. There are currently two Navy Medicine interdisciplinary expert Regional Transgender Care Teams in place to support and improve the health and lives of transgender and gender non-binary Marines. These experts work closely with the Defense Health Agency, as well as Army and Air Force colleagues, to ensure the best clinical practices are incorporated in support of the medical readiness of our transgender and gender non-binary Marines.

We continue to recognize and emphasize the importance of innovative pregnancy and postpartum care, resources, and educational materials for our Marines to facilitate their return to duty. Our physical readiness program is focused on providing postpartum Marines time to fully recover in a healthy manner prior to being required to meet fitness and body composition standards. We also recognize the importance of ensuring our pregnant and postpartum Marines have access to the support they need. Navy Medicine has developed a Postpartum Return to Duty Resource to provide Marines with critical education on physical fitness, mental health, support services, as well as Navy and Marine Corps guidance related to the postpartum transition to full duty. Within the Military Health System, Navy Medicine women's health experts participate with the Defense Health Agency and the other Services on lines of effort focused on women's health, perinatal practices, newborn and in-

fants; as well as review of data and issues related to maternal and infant healthcare disparities, health equity, and social determinants of health that may be impacted by race/ethnicity.

QUESTIONS SUBMITTED BY SENATOR DIANNE FEINSTEIN

Question. General Berger, last year we lost 8 Marines and 1 Sailor during a terrible training accident involving an Amphibious Assault Vehicle off the coast of California. The investigation report highlighted several training and equipment deficiencies.

How is the Marine Corps working to prevent a recurrence of future amphibious vehicle accidents, and has the Marine Corps requested enough funding in the budget to adequately maintain these vehicles and procure the replacement vehicles?

Answer. The Marine Corps is committed to identifying the issues that led to this tragedy and to preventing future occurrences. We have concluded a safety investigation and a command investigation into the facts and circumstances surrounding the sinking of 15th Marine Expeditionary Unit's (MEU) amphibious assault vehicle (AAV) and the resulting loss of life. An investigation into the formation of the 15th MEU is pending endorsement. Finally, a Blue Ribbon Panel of senior Marine Corps and Navy personnel has formed and is currently conducting a strategic review of amphibious operations.

We are confident the safety and command investigations identified contributing and causal factors. As a result of these investigations, the Marine Corps has directed 23 institutional actions to ensure the safe execution of AAV waterborne operations. These actions fall into one of three categories: equipment, procedures, and training. Equipment actions include a combination of equipment advances and additional inspections such as: procurement and sustainment of a Waterborne Egress Capability program; electronic tablets for crewmembers to manage associated technical and procedural manuals; and new criteria for hull watertight integrity, bilge pump function, communications systems, and emergency egress lighting systems. To address procedural actions, the Marine Corps has administered many publication and policy reviews to operating procedures, technical manuals, and safety structure requirements during training. These include updates to: training and qualification prerequisites; authority and decisionmaking procedures; and safety boat requirements. Finally, training actions include implementing additional standards for water survival, underwater egress training for both crew members and embarked personnel, and standardized knowledge tests for crew members. These last two tasks, plus oversight of mechanical and procedural inspections, have to be completed by operational level units and certified by the first general officer in the chain of command in order for them to gain authority to perform waterborne operations.

We have fully funded the AAV program to implement the institutional actions related to the safety and command investigations as well as routine maintenance requirements.

We are confident the directed service level actions will rectify any issues that contributed to this terrible tragedy with the goal of ensuring no similar incident occurs again.

QUESTIONS SUBMITTED BY SENATOR LISA MURKOWSKI

Question. The Navy and Marine Corps Arctic strategy document, "Blue Arctic" specifically states the "The [Naval Services] will be postured to deter aggressive and malign behavior, keep the seas free and open, and assure allies and partners of our long-term commitment to preserving peace and advancing shared interests." It also emphasizes the need for "credible naval forces [to] ensure the ability to deter competitors and rapidly respond to crises in the region."

Do you see any lessons learned in the Marine Corps' Expeditionary Advanced Based Operations (EABO) concept that can be applied to a homeland archipelago, such as the Aleutians, for a deterrence model?

Answer. Yes, the capabilities used to conduct Expeditionary Advanced Base Operations (EABO) would be especially useful in a complex homeland archipelago such as the Aleutians. EABO is a form of expeditionary warfare that involves the employment of mobile, low-signature, persistent, and relatively easy to maintain and sustain naval expeditionary forces from a series of austere, temporary locations ashore or inshore within a contested or potentially contested maritime area in order to conduct sea denial, support sea control, or enable fleet sustainment. The capabilities we are developing to conduct EABO—to include various combinations of manned and unmanned sensors and long-range precision fires—are absolutely applicable to

detecting and countering malign behavior, contributing to integrated deterrence and, if necessary, conducting sea denial to maintain the sovereign integrity of our own waters.

Through an iterative campaign of experimentation and exercises, the Marine Corps will continue to refine and update the capabilities and force structure required to conduct EABO over the coming years.

Question. At a recent budget hearing for the State Department, Secretary Blinken told me that, by his own determination, and I quote: “the United States would be extremely well served by ratifying the Law of the Sea Treaty.” He even went as far as to say that this is not only his opinion, but “it’s been the judgement across the board by our military leadership, uniform and civilian for many years.” Secretary Blinken is the latest in a long line of department secretaries to agree on this point. I believe that ratifying the Law of the Sea is in the best interest of the United States. Along with Senator Hirono, I put forward legislation urging the Senate to ratify Law of Sea.

General Berger, would you expect Marines to be required for missions to uphold UNCLOS norms?

Answer. Yes. Our Marines are expected and trained to uphold our international legal obligations in all military operations.

Question. As a naval service chief, do you believe the Senate should ratify the Law of Sea?

Answer. Consistent with past Commandants, I believe acceding to the Convention could strengthen our position when challenging violations of international law by our adversaries.

While the Convention reflects customary international law on which the United States has long relied for its freedoms of navigation and overflight around the world, acceding to the Convention would reinforce these rights and freedoms.

Question. What benefit will it provide to the United States? Would we be in a stronger military position if we were to ratify the Law of the Sea?

Answer. The Convention reflects the traditional uses of the oceans such as navigation and overflight rights and freedoms across the globe for our civilian and military ships and aircraft. These traditional uses, including innocent passage through other nations’ territorial seas and transit passage through, under, and over international straits, are vital to our national security interests. To date, the United States has relied on customary international law as the legal basis for these rights and freedoms, but customary international law will not adequately protect U.S. maritime security interests over the long term. For instance, a number of our adversaries claim that only States that are party to the Convention enjoy the rights and freedoms that the Convention provides. Acceding to the Convention would solidify these and other rights and freedoms in a manner beneficial to naval operations, facilitate closer cooperation with our allies and partners, and disarm our adversaries of these claims. Joining the Convention is the best means of securing U.S. rights and freedoms, and maximizing the ability of our armed forces to move through and over the world’s ocean waters.

The Marine Corps is a naval expeditionary force-in-readiness prepared to operate inside actively contested maritime spaces in support of fleet operations that are largely dependent upon the navigational rights enumerated in the Convention. Moreover, the United States conducts its operations in coalitions with allies and partners—most of whom are parties to the Convention. Acceding to the Convention will reinforce U.S. leadership and influence in the shaping of global maritime law and policy in ways that serve U.S. interests, validate U.S. maritime activities under international law, and demonstrate U.S. commitment to the rule of law in the conduct of its operations.

Question. And what would you say to those that want to be tough on China and Russia, but are still against the ratification of the treaty?

Answer. Accession to the Convention would allow the United States to participate in future law of the sea discussions on a coequal level with China and Russia, who are member States. In 1983, President Reagan set forth the U.S. Oceans Policy, which stated that the United States will not “acquiesce in unilateral acts of other States designed to restrict the rights and freedoms of the international community in navigation and overflight and other related high seas uses.” China’s increasingly aggressive posture in the South China Sea is a direct attack on the international rules-based order embodied by the Convention. Its conduct of gray zone activities seeks to erode its provisions. As a party to the Convention, U.S. objections to these violations would have significantly more force and credibility. The United States would also be better positioned to contest excessive maritime claims and other unlawful activities by China and others, such as Russia and Iran, who continuously attempt to restrict the Convention’s navigational rights and freedoms.

QUESTIONS SUBMITTED BY SENATOR JOHN HOEVEN

Question. You mentioned in your written statement that you expect to make use of medium altitude, long endurance unmanned aircraft like the MQ-9 even when Marines are deployed in close proximity to our adversaries. Additionally, your fiscal year 2022 budget request includes a substantial investment in the MQ-9A extended range aircraft.

Could you describe the role you expect unmanned aircraft to play for Marines deployed near China or Russia?

Answer. The MQ-9A Extended Range will fulfill a primary mission of communication and data relay with an additional airborne early warning capability. This will provide deployed Marine Corps and Joint Force units with persistent tactical maritime Intelligence, Surveillance, and Reconnaissance (ISR) and command and control gateways. The MQ-9A Extended Range is also a critical enabler to the Naval force in building an alternate Precision, Navigation, and Timing network.

The Marine Corps seeks to procure six MQ-9A Extended Range systems in fiscal year 2022, and a total of 18 systems over the next several years, to form three Unmanned Aircraft Systems (UAS) squadrons. The Marine Corps will leverage an existing Air Force system and two current Marine Corps assets in USCENTCOM to reduce risk, while providing advanced capabilities to the Marine Corps and overall joint warfighting enterprise.

Additionally, the Marine Corps continues to develop and experiment a family of UAS with a variety of plug-and-play payloads. These systems will give ground combat units organic Reconnaissance, Surveillance, and Target Acquisition (RSTA) assets capable of supporting long-range precision kinetic and non-kinetic fires, both afloat and ashore. This includes conducting extended user evaluations with industry leading systems to include the UAV V-BAT and the Stalker UAS to inform requirements for the Ground Combat Element.

QUESTIONS SUBMITTED BY SENATOR JOHN BOOZMAN

Question. General Berger, the budget request includes a significant increase for the Ground Based Anti-Ship Missile program. I understand this program is vital to your future force design. Given the tough budget decisions facing this committee:

Why is this program so important to the Marine Corps and what progress was made on the development of this program since last year?

Answer. Ground Based Anti-Ship Missile (GBASM) is the Marine Corps' top modernization priority and is the key lethality component for the Marine Corps to facilitate sea denial in support of naval and joint operations. The capability creates cost impositions for an adversary by introducing a new and highly credible threat into their decisionmaking, while providing us with a relatively low cost and highly effective capability.

The initial materiel solution for GBASM is the Navy-Marine Expeditionary Ship Interdiction System (NMESIS) which consists of two Naval Strike Missiles mounted on a remotely operated Joint Light Tactical Vehicle (JLTV)-based chassis. By combining existing technologies in the missile and the platform, the Marine Corps has reduced programmatic risks through the use of proven capabilities, which enables us to move faster. The Marine Corps successfully tested this system against a ship target in November 2020, and in our fiscal year 2022 budget request, we are seeking funding for 10 production representative models (PRMs) for further developmental and operational testing. With the ability to strike enemy ships at ranges of 100 nautical miles and beyond, we believe it will be a "game changer" for the Marine Corps, the Naval Fleet Commander, and Combatant Commanders.

Additionally, the Marine Corps is developing a longer-range capability, which we call "Long Range Fires." The Marine Corps successfully tested this program in March 2021.

Question. How will the Unfunded Request for additional missiles support your fielding of this capability?

Answer. Naval Strike Missiles are the munition component of the Navy/Marine Expeditionary Ship Interdiction System (NMESIS) which is the Marine Corps' first iteration of the GBASM capability. These additional missiles in the Unfunded Priority List (UPL) would provide greater magazine depth for the units that will employ them in the Indo-Pacific.

As the pacing threat moves with us and technology develops at a speed faster than the budget, funding the entirety of our UPL request provides us the opportunity to capitalize on successful technological developments. This will accelerate additional capability to the Combatant

Commanders, specifically in the Indo-Pacific, buying down strategic risk for them and our forward deployed forces, and deterring conflict sooner.

Question. General Berger, I want to expand on 2030 Force Design. Secretary Austin recently testified in this committee that China is the #1 pacing threat. How will the different elements of your Force Design support the Joint Force within the INDOPACOM area of responsibility and how does the Pacific Deterrent Initiative support your efforts within the Joint Force?

Answer. A new type of unit, the Marine Littoral Regiment (MLR), is a vital element of the Marine Corps' Force Design transformation. These new units will be task-organized and dispersed across key maritime terrain in the Indo-Pacific region to support the Naval and Joint Force. The MLR capabilities will augment and reinforce a host nation's ability to monitor, expose, and challenge malign behavior, but the MLRs will also be fully capable of operating without host-nation support if required. Additionally, the MLRs will be highly mobile, constantly changing their positioning and posture to increase ambiguity and increase the adversary's challenge of monitoring and targeting MLR units. In order to provide lethality when needed, the MLRs will possess complementary capabilities of sensing, communication, maneuverability, and precision fires. These characteristics and capabilities will reduce an adversary's confidence and encourage off-ramps from conflict.

Marine Corps investments in new capabilities and current operations are in direct alignment with and supported by the Pacific Deterrence Initiative (PDI). Namely, PDI supports the Commandant's Force Design 2030 initiative to build a force able to operate in actively contested spaces in support of the Joint Force, providing the Combatant Commander with ready, relevant crisis response forces and a capability to work effectively with allies and partners.

As part of the Naval Expeditionary Force resiliency, investments allow Marine Air-Ground Task Force (MAGTF) elements to maneuver, communicate, and conduct intelligence, surveillance, and reconnaissance within contested maritime environments. Air defense is provided through investments which will identify, track, and defeat enemy Unmanned Aerial Systems. Funding is also provided for effective Aviation Command and Control, to foster resiliency in logistics lines of communication, deter and defeat threats in the electromagnetic spectrum, and provide precision strike fire support in support of distributed operations. Investments in these capabilities allow our forward deployed Stand-in Force to support Joint operations inside the enemy's weapon engagement zone (WEZ) and to compete and deter in the contact and blunt layers.

Additionally, PDI investments in security cooperation programs will strengthen relationships with our allies and partners in the Indo-Pacific region, and these investments directly support the Marine Forces Pacific Afloat Prepositioning Training and Exercise Employment Plan through the funding of exercises FREEDOM BANNER, BALIKATAN, and COBRA GOLD.

SUBCOMMITTEE RECESS

Senator TESTER. This committee stands in recess.

[Whereupon, at 11:02 a.m., Thursday, June 24, the subcommittee was recessed, to reconvene subject to the call of the Chair.]

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 2022

WEDNESDAY, JULY 21, 2021

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 10 a.m. in room SD-138, Dirksen Senate Office Building, Hon. Jon Tester (chairman) presiding.

Present: Senators Tester, Shelby, Murkowski, Moran, Hoeven, and Boozman.

DEPARTMENT OF DEFENSE

NAVY AND AIR FORCE WEAPONS SYSTEMS DIVESTMENTS

OPENING STATEMENT OF SENATOR JON TESTER

Senator TESTER. I will call the hearing to order. I want to begin by welcoming our witnesses.

Vice Admiral Crites, Vice Admiral Kilby, Lieutenant General Nahom, I want to thank you all for being here today.

This subcommittee typically holds hearings with the senior leadership of the military services to learn about the budget requests for the upcoming fiscal year and the general posture of each department. Our topical hearings are reserved for those cross-cutting issues that have significant financial impacts, there are a lot of policy issues wrapped up in divesting force structure, but when the supporting arguments hold up budgetary decisions as a reason to make these moves, we need to fully understand what you were trying to accomplish.

The military, as a whole, is divesting from \$2.8 billion in legacy systems in fiscal year 2022 budget request, and that dollar amount is split right down the middle between the Navy and the Air Force. On the surface it makes sense to divest systems and platforms that do not adequately meet current military needs and that demand more resources than they are worth.

Unfortunately, it is difficult to fit all the puzzle pieces together in terms of what constitutes a legacy weapon, what new technologies are ready to field, and how best to divest our defense budgets. I called this hearing to start putting that puzzle together.

Next week, this subcommittee will hold a classified briefing on the technologies needed to counter China and Russia, to gain a full picture of what is at stake. I am eager to work with you to find the right balance between divesting force structure and investing in the future.

Once again, I want to thank the witnesses for their testimony today, and look forward to hearing from them.

With that, I will turn it over to you, Senator Shelby.

STATEMENT OF SENATOR RICHARD C. SHELBY

Senator SHELBY. Thank you, Mr. Chairman. I also want to welcome our witnesses today.

I look forward to hearing about the Navy and Air Force plans for this divestment of weapon systems in 2022, and how those plans better position our forces to deter, and if necessary, win in the near-peer fight.

The proposal for divestment this year totals \$1.37 billion for the Air Force, and \$1.26 billion for the Navy. The Department's stated purpose for the divestments is to retire vulnerable systems and programs that no longer meet security needs, freeing resources to invest in higher priority items. And while there seems a straightforward framework for divestment decisionmaking, I would like to better understand here how the budget top line impacted these decisions.

Of the Navy's \$1.26 billion 2022 divestment recommendations, \$930 million is from divestment of ships. These include cruisers, littoral combat ships, riverine craft, and dock landing ships.

Given the Navy's stated priority of increasing fleet size to compete in the Indo-Pacific, I would expect that those savings are used to increase shipbuilding and ship operations. The fiscal year 2022 budget request only includes a \$300 million increase in ship operations that is accompanied by a \$700 million decrease in shipbuilding.

The Air Force, on the other hand, is divesting fighters, tankers, logistic aircraft, command and control, and intelligence, surveillance, and reconnaissance platforms. I think we can all agree here that some of these aircraft have been in service longer than originally envisioned, and many would be at a significant risk operating in an anti-access, and area-denial environment.

That said, I want to understand, here at the committee level, how the loss of these aircraft will be fully mitigated by the introduction of new aircraft, or new systems, by increasing the pace of procurement of aircraft currently in production. I appreciate the complexity of the decisions the Department has to make to balance near-term capabilities and future technologies, and maintaining readiness across the force structure.

I believe it is important that we have a better understanding of how that has been accomplished in this proposal. Additionally, I would like to know what the plan is for the items that are divested. A very conservative estimate of the initial investment and the procurement of in terms of the Air Force would like to divest is \$14 billion I understand. That is a significant investment that we must be thoughtful about here on the committee.

I raise this issue because this proposal includes divestments of naval vessels that entered the Service less than 5 years ago, with a price tag around \$520 million each. It also includes unmanned ISR platforms that we just finished procuring.

It is important we understand what you are doing, why you are doing it, and how you are doing it.

Thank you, Mr. Chairman.

Senator TESTER. Thank you, Senator Shelby.

Next, we are going to hear from two folks. We are going to hear from Vice Admiral Kilby, and then we are going to hear from Lieutenant General Nahom.

We will start with you Admiral Kilby.

STATEMENT OF VICE ADMIRAL JAMES KILBY, DEPUTY CHIEF OF NAVAL OPERATIONS FOR WARFIGHTING REQUIREMENTS AND CAPABILITIES

Admiral KILBY. Thanks, sir. Chairman Tester, Vice Chairman Shelby, and distinguished members of the subcommittee, on behalf of Vice Admiral Crites and myself, thank you for the opportunity to appear before you today to discuss the Navy's proposed divestments in the 2022 budget request, we thank the subcommittee for your support of the Navy.

The United States Navy remains the preeminent maritime force in the world. With 297 ships, your Navy is underway around the world today, and every day, protecting America's security, prosperity, values and interests across the globe.

Our goal is to prevent conflict, but should deterrence fail, we are ready to answer the call to fight and to win. Our maritime advantage is being challenged by adversaries that are becoming more capable and more aggressive. The Navy and the Nation must maintain a clear-eyed resolve to compete, deter, and if necessary, defeat our rivals.

Our actions now shape the maritime balance of power and we continue to develop and evolve a more lethal force to deliver all-domain Navy power and maintain our advantage at sea. Naval power is not simply a function of the number of ships, it also requires the right balance of readiness, modernization, and training.

The Navy's 2022 budget balances investments across readiness, capabilities, capacity, and taking care of our people to maximize our contributions to the Joint Force within the limits of available resources.

Our budget decisions are underpinned by campaign analysis, and warfighting analytics, and informed by aggressive reform efforts to align every dollar to provide maximum warfighting impact. In short, our budget funds what we need most in an era of strategic competition.

However, the Navy is also dealing with a flat budget top line that has not kept pace with inflation, and the force is growing in size. As the subcommittee knows, these factors pressurized the budget and force difficult funding decisions based on warfighting priorities to deliver the right mix of capabilities the Nation needs most.

That means divesting of platforms that are less capable, less effective, and less relevant in the current and future strategic environments, so that we can modernize and sustain the readiness and wholeness of our current fleet, it also means stopping or slowing procurement of existing platforms in order to develop the next-generation capabilities necessary to keep pace with our adversaries.

I want to be very clear here. I am not saying the platforms proposed for divestment are unimportant, or provide no value, but we

have to ensure that we focus on our efforts on delivering the best, most ready, and most capable Navy we can.

That is what the 2022 budget represents. It makes hard choices, choices we believe are necessary to maximize naval power, and deliver the highest war-fighting return on investment with acceptable risk.

I urge the subcommittee and Congress to consider the Navy's 2022 budget in this light. Within the resources available, how relevant each asset is, and in the future fight of how much additional investment is required to keep the assets we are divesting of relevant.

Again, we must be clear-eyed about the investments needed to compete, deter, and win in the future fight and the urgency to accelerate those capabilities.

Thank you for the opportunity to discuss the Navy's 2022 budget with you today. And we look forward to working closely with you and your staffs to ensure we will continue to field the most capable and relevant Naval Force to meet our Nation's strategic objectives. [The statement follows:]

PREPARED STATEMENT OF VICE ADMIRAL JAMES W. KILBY AND
VICE ADMIRAL RANDY B. CRITES

Chairman Tester, Vice Chairman Shelby, distinguished members of the Subcommittee, thank you for the opportunity to testify today on the Navy's proposed divestments in the fiscal year (FY) 2022 President's Budget (PB-22). We thank Congress and the Subcommittee for your support in maintaining a Navy that is both lethal and ready to deploy globally in defense of U.S. national interests.

In an interconnected and interdependent world, a dominant naval force and a strong maritime strategy are critical to the security of our Nation. The global security environment is increasingly influenced by our competitors, requiring the Navy to provide credible combat power forward to ensure a ready response to global crises and disasters. Even as the world focused on dealing with the COVID-19 pandemic last year, your Navy continued to deploy to hot spots around the globe where U.S. interests are challenged, executing eight major Carrier and Expeditionary Strike Group deployments, amassing close to 700,000 flight hours and over 23,000 total steaming days. This builds on two decades of Navy forces deploying at our highest operational tempo since World War II, in a conflict that has lasted five times longer.

As our national security posture evolves to confront new challenges, the Navy continues to invest in key naval capabilities to maximize our naval power contribution to the Joint Force. PB-22 advances critical Navy priorities to defend the nation, innovate and modernize the force, increase resilience and readiness, and take care of our Sailors, civilians, and families. For example, PB-22 supports the sustainment of our readiness recovery to deliver credible ready forces now by accelerating the Navy's Shipyard Infrastructure Optimization Program (SIOP), and fully funds two submarine overhauls in private shipyards. PB-22 aggressively pursues increased lethality and modernization of capabilities with the greatest potential to deliver non-linear warfighting advantages through significant research and development investments in distributed and networked effects to establish and sustain sea control, and future platforms and experimentation with unmanned systems on the sea, under the sea, and in the air. PB-22 continues key investments in advanced technologies and modernization by prioritizing the recapitalization of the strategic ballistic missile submarine, the Columbia class, which remains the Navy's highest acquisition priority. And importantly, PB-22 supports our people and the quality of their life by providing a 2.7 percent pay raise in FY 2022, increasing investments in mental health and sexual assault prevention and response programs, and developing talent through training programs including Ready Relevant Learning, Live Virtual Constructive, and the Naval Community College.

Aligned with the Interim National Security Strategic Guidance, the Tri-Service Maritime Strategy, and within the limits of available resources, the Navy's PB-22 budget represents the best balance and right mix of strategic investments in our Sailors, readiness, capability, and capacity. Our budget decisions are underpinned by campaign analysis and warfighting analytics, and informed by aggressive reform

efforts to align every dollar to provide maximum warfighting impact. As we balanced the urgent readiness and modernization needs of our force today with investments in the future force, we also had to make difficult funding decisions to divest of less capable platforms and systems, freeing resources to invest in a future force that can deliver greater efficiency and effectiveness. These divestment decisions were rigorously reviewed, analyzed, and debated to ensure we retain the capabilities needed to be ready to fight tonight, while investing smartly for the future. At a high level, this analysis can be summarized by examining the fiscal context and warfighting value associated with divestments.

Fiscal Context. In constant, non-inflated dollars, the Navy's (as a Service) total funding level (or budget topline) has remained relatively flat since 2010. When inflation is factored in, the result is an overall loss of buying power. Our budget topline today is roughly the same as it was in 2010, despite a growth in the fleet size from 288 ships in 2010 to 297 ships today. In actual dollars, PB-22 reflects a 0.6 percent increase in Navy funding over the FY 2021 enacted appropriations level.

The Navy and Department of the Navy (DON) has been able to offset some of this lost buying power through a series of reform efforts going back to 2012. From PB-12 to PB-22, the Department has executed or programmed savings of over \$150 billion from reform and efficiency initiatives. These reforms involved business process improvements and efficiencies, but also divesting of less capable platforms, mission sets, or capabilities; reduced procurement; and changes in active and reserve component mix. While more efficient, the Department is now also very lean with little margin to address fact-of-life changes, such as increasing material and labor costs that exceed inflation or pandemic response. Going forward, with very few programs that have not already been heavily scrutinized, reform and efficiencies are unlikely to produce substantial savings. As identified in several recent Congressional Budget Office publications, the pressure on all Navy accounts will continue, with costs increasing at rates higher than projected inflation rates.

The ability to self-finance growth in the size of the force is also limited by strategic priorities and accounts that Navy considers non-discretionary. We must pay our people and sustain our current force—we will never field a hollow force. We must keep the Columbia class program—a once-in-a-generation recapitalization program—on track for lead ship delivery in 2027 in order to meet U.S. Strategic Command's requirement for Columbia ballistic missile submarines to be on patrol by 2030. And now we are faced with a once-in-a-century investment to recapitalize and modernize our public shipyards. These must-fund priorities limit our ability to recover readiness, modernize the force, address shortfalls, and invest in new technologies to pace strategic threats.

Finally, unstable and unpredictable budgets encumber the Navy's ability to maximize use of every dollar. Continuing resolutions drive inefficiency, uncertainty, and delays in execution that become increasingly difficult to recover from in the years to follow. This impacts everything from acquisition new starts to ship maintenance planning to permanent change of station funding for Sailors and their families.

Warfighting Value. Continuing to purchase and/or sustain older, less capable or obsolete equipment takes defense dollars away from the acquisition of systems that are needed for modernization or sustainment of higher value systems. Our competitors—especially China—continue to advance their capabilities. We must outpace those advances to remain a credible deterrent to conflict around the world. This requires us to maintain and improve this advantage on land, at sea, in the air, and in emerging domains, including space and cyberspace. We must divest select less capable platforms to ensure that every defense dollar is spent on programs and equipment that will be relevant in the next fight. PB-22 proposes cuts to systems and capabilities that no longer meet the challenges and requirements of the defense strategy, making room for more advanced programs that maximize naval capability and lethality aligned with the Interim National Security Strategic Guidance.

NAVY'S PB-22 PROPOSED DIVESTMENTS

The FY 2022 President's Budget includes a total of \$1.3 billion in cost savings across the Department of the Navy from proposed divestments in FY 2022. This includes retiring less capable platforms, reducing costs, and realigning funds to source higher priority efforts to field the strongest balance of capabilities. The major Navy divestments include:

Decommission Two Guided Missile Cruisers (CG 66 and CG 68). Today, the average cruiser age is 32 years, with four ships already beyond their 35 year service life expectancy. The Navy plans to divest two non-modernized cruisers in FY 2022, in addition to the five previously programmed for FY 2022 decommissioning in the FY 2020 and FY 2021 President's Budgets. Decommissioning these two non-modern-

ized ships enables reallocation of funds to achieve program wholeness for the modernization of the remaining five CGs in the cruiser modernization program (CG 63, 64, 65, 69, and 71). Due to ongoing execution challenges, discovered growth work, and underestimation of risk in system reactivation, cruiser modernization costs have grown by 90 to 200 percent above their initial programmed estimates. These five ships provide sufficient capacity to sustain air and missile defense commander (AMDC) coverage as DDG Flight III ships begin to deliver in FY23 with more capable advanced radars.

Retaining CG 66 and CG 68 would require approximately \$1.5 billion to execute the required maintenance and modernize the ships, and CG 66 would likely return to operational status “late to need” after the low-point inventory of AMDC-capable ships. A decision to retain these two ships would provide, at most, 12 years of remaining service life each, assuming a 45-year expected service life, and realistically four remaining deployments total. This equates to ~\$400M per deployment when adding the cost of modernization to the operations and sustainment costs for their remaining service lives—a low return on investment.

The five cruisers previously planned for decommissioning in FY 2022 are either at the end of their service life (CG 56 and 57) or are less-capable ships with only basic ballistic missile defense capability (CG 61, 72, and 73). The cost of maintaining aging cruisers with substantial degradations in material condition, including tank top cracking, aluminum superstructure stress cracks, and increasingly obsolete systems is prohibitive. Less-capable cruisers are being divested to fund more capable Air Defense Commander (ADC) ships. DDG Flight III ships and selective service life extensions of ADC cruisers will provide the ADC capability needed in the future. The inventory of vertical launching system (VLS) cells was considered in the divestment decision. VLS cells in aging cruisers that cannot get to the fight due to persistent material challenges add no warfighting value or capability. It is more important to have fully ready, materially sound, sustainable platforms equipped with and able to employ our most capable offensive and defensive weapons.

Decommission One Dock Landing Ship (LSD 41). PB-22 continues the divestment of dock landing ships consistent with the Commandant’s Planning Guidance and Force Design 2030 to divest of aging, least capable force structure in order to reallocate funding towards improving the Navy’s lethality. The aging LSD ships continue to have challenges with overall maintenance health and there is diminishing return on investment for sustaining their increasingly obsolete systems. PB-22 includes the decommissioning of LSD 41 in FY 2022. LSD 41 is currently 36 years old. This divestment avoids the cost of an extensive 21-month CNO maintenance availability in FY 2022, three years before the end of expected service life at 40 years.

LPD Flight II is the functional replacement for LSD ships and begins to deliver in FY 2025. LPD Flight II integrates a more capable combat system, radar, and communications system and will be CMV-22 capable. Navy is committed to delivering the most capable multi-mission amphibious warships, partnering closely with the Marine Corps and our critical industrial base. Amphibious warships, including the LPD Flight II and the future Light Amphibious Warship, remain a key component of the Nation’s global forward presence, playing a pivotal role in responding to world crises and supporting a broad range of missions across the spectrum of conflict.

Decommission Four Littoral Combat Ships (LCS 3, 4, 7, and 9). The FY 2021 President’s Budget proposed decommissioning of the first four LCS ships (LCS 1–4) because they are dedicated test ships with unique systems and are not configured like the other LCS ships. The initial two test ships will decommission in FY 2021 and PB-22 re-proposes to decommission the third and fourth test ships once all testing is complete in FY 2022. Decommissioning LCS 3 and LCS 4 avoids the significant cost to upgrade these test ships to the common LCS configurations, including structural, cooling, and hull, mechanical, and electrical (HM&E) upgrades. It also avoids the additional cost of procuring a mission package for these ships, which are not included in the current mission package procurement plan. Continued fleet operations would require purchasing a mission package for each ship.

Decommissioning LCS 7 and LCS 9 is a difficult funding decision that allows the Navy to free resources needed to invest in higher priorities. They were selected because their decommissioning presents less impact to the Fleet employment and force management because these ships are not scheduled to deploy in the near-term. In addition, both ships do not have lethality and survivability upgrades or Naval Strike Missile installations planned within the next two years and both require combining gear repairs.

Divesting these four LCS ships results in cost savings and significant cost avoidance to enable investments in higher priority capability and capacity to prevail in future conflicts. Strategic competition and the on-going focus on the Indo-Pacific re-

gion requires a more capable small surface combatant for operations in contested environments. The remaining LCS ships, with lethality and survivability upgrades and the Naval Strike Missile, along with the FFG 62 Constellation class will provide the improved capability to support the full range of military operations as part of a more lethal Joint Force.

Divest 12 Mark VI Patrol Boats from Coastal Riverine Squadrons. Consistent with the divestment decisions above, investing in more capable assets is necessary to prevail in strategic competition and meet the demands of the defense strategy. In developing the PB-22 budget, the Navy analyzed the MK VI Patrol Boat's ability to compete against a near-peer adversary and determined that the savings from divesting MK VI would be better invested in higher priority platforms better suited for strategic competition. The MK VI requirement originated from a November 2007 Commander, U.S. Fifth Fleet Urgent Operational Needs Statement for a visit, board, search, and seizure overwatch platform in the littorals. This mission is decreasingly relevant in the current and future threat environments, and the other MK VI missions can be conducted by existing Navy surface combatants and U.S. Coast Guard patrol boats.

The final deployment for the affected coastal riverine companies is scheduled to be complete by approximately the end of 2021. MK VI divestment provides cost savings from operations and maintenance funding and manpower reductions. Navy continues to assess options for final disposition, including potential transition to another service or another U.S. government agency, nomination for Foreign Military Sales (FMS), or placement into long-term storage. The Navy International Programs Office has had at least one inquiry from a nation showing interest in the Navy's MK VI patrol boats and in January 2021, the Department of Defense announced that Ukraine is procuring two new MK VI patrol boats, with a potential total sale up to 16 craft, through an FMS case.

Accelerate Divestment of Navy F/A-18A-D Hornets. The FY 2019 President's Budget included a phased divestment of Navy F/A-18A-D legacy Hornets, planned for completion by FY 2024. PB-22 accelerates this divestment plan to complete in FY 2022, in conjunction with the completion of the Navy Reserve's transition from F/A-18A-D to F/A-18E/F from the Navy Active Component, and F-16C/D from the U.S. Air Force and Air National Guard by the end of FY 2022.

Navy will divest 45 Hornets in FY 2022. This divestment reduces long-term support costs for these older Type/Model/Series, while retaining adversary capacity with F-16s and Block I Super Hornets, and Naval Aviation Warfighting Development Center testing capability using Block I Super Hornets.

Accelerate Divestment of Broad Area Maritime Surveillance Demonstrator (BAMS-D). The FY 2021 President's Budget originally scheduled BAMS-D divestment in FY 2023.

BAMS-D has limited capability to perform maritime and littoral intelligence, surveillance, and reconnaissance (ISR). PB-22 accelerates divestment of BAMS-D to FY 2022 in order to harvest cost savings sooner and reinvest in higher priority capabilities and capacity. BAMS-D is not a program of record and was intended to be a demonstration prototype for MQ-4C Triton, which will provide greater capabilities. Maritime ISR missions will be conducted by P-8A Poseidon, MQ-4C Triton, and EP-3E operations, which were extended by one year to FY 2024 in compliance with the FY 2011 National Defense Authorization Act.

CONCLUSION

Thank you for the strong support this Subcommittee continues to provide our Navy. The Navy takes seriously our duty to be good stewards of taxpayer dollars by assessing and recommending the hard decisions necessary to deliver the highest warfighting return on investment and maximize naval power within limited resources. This requires a multi-pronged effort to improve affordability, increase efficiency through reform, and divest of systems that are decreasingly relevant to the strategic environment or no longer operationally effective in executing their missions. We ask for Congress' support of the critical balance between readiness, capability, capacity and taking care of our people as reflected in the FY 2022 President's Budget.

Senator TESTER. Thank you, Admiral. Next, we have General Nahom.

General.

**STATEMENT OF LIEUTENANT GENERAL DAVID S. NAHOM, DEPUTY
CHIEF OF STAFF FOR PLANS AND PROGRAMS, U.S. AIR FORCE**

General NAHOM. Chairman Tester, Ranking Member Shelby, and distinguished members of the committee, thank you for the opportunity to testify on the Air Force divestitures and the readiness implications. Additionally, thank you for your continued leadership and dedication to the 689,000 Total Force Airmen serving around the world today.

The American homeland is no longer sanctuary. Our citizens face threats from a variety of actors, and our competitors continue aggressive efforts to negate our longstanding war-fighting advantages.

China's actions show a sense of urgency. They see a future that is very different from the one that we would want to see, and they are taking actions to realize that future. Their efforts include a massive buildup of military power, and a clear intent to use that military to gain leverage on us, and our allies, and partners, is becoming ever more critical that we recognize the need to change and modernize.

Through the 2022 President's budget, the Department and the Air Force seeks to continue investment in technology that is both lethal in survival against a peer threat. This ultimately means divestment of some portions of the legacy platforms in order to free up personnel and resources in order to fill more capable systems to address emerging threats. As we look to transition away from older, less capable aircraft and appropriately managed fleet sizes, some legacy capabilities we will see shifts in investments.

The Air Force fleet is currently 29 years old in fleet average, the oldest air fleet of any service, we must recognize and continue to invest in new platforms and weapon systems to ensure the Nation has the right mix of cutting-edge technology needed to remain competitive and stay ahead of our adversaries. Keeping aircraft identified for retirement means funds intended for investment in newer aircraft and capabilities will now be used to fund older, less capable aircraft.

We must transition away from capabilities of today to capabilities required for tomorrow, new capabilities that can operate and survive in both high-end and low-end conflict. Failure to recognize the need to modernize has long-standing implications, and injects risks in the lethality of our force.

Keeping aircraft we weren't planning to retain also requires manpower, a highly valuable resource we cannot afford to waste. If we are unable to retire legacy aircraft, we exasperate an already stressed manpower situation, and risk not having the manpower necessary to transition to, operate and maintain new aircraft such as the F-35 and KC-46.

Weapon System Sustainment, or WSS, costs are another clear indicator the Air Forces need to modernize. Even with a 15 percent decrease in total aircraft inventory our sustainment costs have increased 130 percent in the last 20 years. Additional legacy aircraft break one-third more often, and take 10 percent longer to fix than they did just 2 decades ago.

This drives an increased maintenance workload, adding aging aircraft back into the maintenance cycle means something else will

likely not get done on aircraft that we actually need for peer competition.

In fiscal year 2022, we are asking the Congress to allow us to better manage our fleet. We cannot be prepared for high-end fight without trade-offs now. While painful, it is better to accept risk today when we have the ability compared to the future, when we may not have that luxury. Through that lens, and from our perspective, these divestitures are less about what we lose more about what we gain.

Again, thank you for your support, and with your help, we remain committed to making thoughtful divestiture decisions. I look forward to your questions.

[The statement follows:]

PREPARED STATEMENT OF LIEUTENANT GENERAL DAVID S. NAHOM

Chairman Tester, Ranking Member Shelby, and distinguished members of this committee, on behalf of Acting Secretary of the Air Force, the Honorable John P. Roth, and the Chief of Staff of the Air Force, General Charles Q. Brown, Jr., thank you for the opportunity to testify for the Air Force.

Your Air Force remains committed to making the hard choices required to balance the need to preserve near-term readiness for today's missions with the imperative to also build the long-term readiness essential to prevail in strategic competition with China or any other nation.

National security is evolving. The clear and ever-present danger of previous generations has become far more opaque and complex. Our success in the strategic battlespace is dependent on the relevancy of our capabilities and the Airmen who wield those resources.

Strategic competition utilizes both long-term strategy and short-term improvisation. Our nation's military potency relies on developing our airpower inventory toward platforms, equipment, and capabilities that will be relevant in peer competition in 2030 and beyond. To achieve this, we must shed capabilities that are too old, irrelevant in the future dynamic environment, or are unsustainable.

We look forward to collaborating closely with this committee to explore and evaluate all divestiture options regarding the A-10, F-15C/D, F-16C/D, E-8, MQ-9 Combat Lines, RQ-4, C-130H and our tanker transition plan that best help us to deliver on our promise to "Fly, fight, and win...airpower anytime, anywhere."

CURRENT CAPACITY AND CAPABILITY

Current Air Force aircraft are becoming significantly more expensive to sustain as they age, and our fleet is the oldest in the Department of Defense. The average age of the Air Force fleet is 29 years, while the U.S. Navy is 14 years and the U.S. Army is 15 years. In comparison to our allies, the average age of the Royal Australian Air Force (RAAF) is 9 years and the Royal Air Force (United Kingdom) is 16 years. Weapons System Sustainment (WSS) costs have increased 130 percent over the last 20 years, even with a 15 percent decrease in total aircraft inventory (TAI). We need new platforms and weapons to replace a legacy force, but also must invest in cutting-edge technology needed to confront and pace peer competitors.

THE FIGHTER FLEET

Our planned fighter portfolio, relevant in 2030 and beyond, requires deliberate development, acquisition, training, modernization, and sustainment of aircraft that meet the demands of future conflicts. As part of our proposed fighter force structure change, the Air Force must transition its fighter fleet from seven platforms (F-35, F-22, F-16, F-15EX, F-15E, F-15C, and A-10) to four platforms (NGAD, F-35, F-15EX, and F-16) plus the A-10 in the near/mid-term. To attain the desired fighter fleet, the Air Force must right-size current aircraft inventories to expedite the transition away from less capable, aging aircraft and emphasize investment in future capabilities such as Next Generation Air Dominance (NGAD) and F-35 modernization. The desired Air Force fighter fleet should match the capability and capacity of both platforms and weapons to maximize lethality.

A-10 THUNDERBOLT

The A-10 Thunderbolt has proven to be one of the most durable and capable close air support aircraft in the Air Force inventory since its introduction in 1977. The Air Force believes its analysis supports reducing 42 A-10 aircraft from the current 281 to 239 in Fiscal Year 2022 (FY22) and plans to reach an end-state of 218 by FY23. This reduction will appropriately size the fleet for cost-effectiveness while simultaneously providing the capability to counter violent extremist organizations and addressing lower-end fights into the 2030s.

A reduction of A-10 aircraft in FY22 will reset the fleet from nine to seven combat squadrons. A 218 aircraft fleet allows Attack Squadrons to maintain a minimum of 18 Primary Mission Aircraft Inventory, guaranteeing one squadron is always available to support combatant commander requirements for close air support and combat search and rescue.

As we reduce the fleet to 218, by 42 in FY22 and an additional 21 in FY23, we will continue to re-wing and modernize the remaining A-10s. Re-winging is the A-10's most significant modernization program and we have purchased wings to outfit a fleet of 218 aircraft. In FY22, we will continue executing FY21 funding to begin installs and support engineering change orders, and other government costs that are typically required to execute major modification efforts of this nature.

Failure to right-size the A-10 fleet has considerable consequences. Maintaining current fleet numbers will result in a significant buyback cost to the Air Force to upgrade and sustain A-10s that are not needed to meet future requirements, ultimately impacting the Air Force's ability to purchase aircraft that will win a high-end fight.

The human capital toll is also significant. Between FY21-22 a total of 91 F-35s will deliver. Failure to right-size the A-10 fleet means hundreds of maintenance personnel will not be available to resource platforms such as the F-35. While adding funds could solve the personnel deficit, new recruits require training with a lead time of at least a year (post recruitment), and the most critical billets of experienced maintainers requires years to create and cannot be purchased. Ultimately, relief is required from legislation that currently prevents retirement of any A-10s. A right-sized A-10 fleet provides the capability, capacity, and affordability to achieve National Defense Strategy objectives and meet air superiority and global strike needs for the Joint Force.

F-15C/D EAGLE

The F-15C/D supports both Homeland Defense and the air superiority mission. Our F-15C fleet is aging, with two-thirds of the fleet past its designed service life. The 234 F-15C/Ds in the Air Force inventory will reach the end of their design service life in the next six to eight years, and our analysis shows additional service life extension programs are not cost effective.

The FY22 President's budget request divests 48 F-15C/Ds from the active fleet (234 aircraft to 186 aircraft), which includes the reduction of the F-15C/D squadron at Royal Air Force Lakenheath.

We have already started to replace this fleet with a modernized successor by purchasing the F-15EX. The F-15EX "Eagle II" will provide superior sensor, range, and payload for Critical Infrastructure Defense. The transition from a seven-fighter force structure to a four-fighter construct enables the Air Force to focus efforts on capabilities relevant in the future spectrum of conflict. As the F-15C/D fleet is reduced, increases in F-15EXs and F-35s will ensure no degradation in capabilities.

F-16 C/D FIGHTING FALCON

The F-16 is the Air Force's primary multi-role fighter and Suppression of Enemy Air Defense aircraft. Our more than 600 late block F-16s will provide affordable capacity for the next 15 or more years, in both competition and more permissive combat environments.

The Air Force's current fleet consists of 936 F-16s with 325 Pre-Block and 611 Post-Block aircraft. Starting in FY22, due to rising costs in sustainment, the Air Force begins a phased approach to a F-16 fleet Pre-Block reduction, decreasing the fleet by 47 F-16s (936 aircraft to 889 aircraft). In FY22, we will continue to modernize the Post-Block F-16s we keep as our "affordable capacity" fighter into the 2040s. The F-16 investment strategy funds modifications for the most capable, late block aircraft to ensure they can operate and survive in today's threat environment.

The F-16 Pre-Block fleet is not lethal nor survivable enough to survive against near-peer air defense systems and threats. In order to facilitate these capability improvements, we must divest legacy F-16 Pre-Block force structure and continue in-

vestment in needed National Defense Strategy capabilities that will win a high-end fight.

E-8 JSTARS

The highly contested environment of the future will require sophisticated command and control to facilitate battlespace management and highly agile sensing grid capabilities. To stay ahead of emerging threats, we must accelerate intelligence, surveillance, and reconnaissance (ISR) modernization. The Air Force will improve ISR capabilities by developing, producing, and fielding a family of interconnected and multi-role crewed and uncrewed systems. This investment pivot requires the Air Force to divest the E-8 Joint Surveillance and Target Attack Radar System (JSTARS), which cannot survive in a highly contested environment. We must fund emerging ISR capabilities that can collect in the most complex and dynamic areas.

In FY22, the Air Force seeks to retire 4 JSTARS aircraft to (16 aircraft to 12 aircraft). JSTARS does not support any ISR 2030 future force requirement, nor does it support any near-peer engagement. It is operationally imperative that, as JSTARS aircraft are retired, personnel shift to assist in other, critically understaffed, areas in support of newly emerging missions.

Currently, the Air Force is seeking relief from congressional language that prevents immediate retirement of any E-8 JSTARS aircraft, or language that hinders retirement. As required, the Air Force is currently in the process of coordinating the required certification through the Secretary of Defense (SECDEF) for approval.

MQ-9 REAPER

The MQ-9 Reaper has proven extremely valuable as an uncrewed aircraft operating in permissive environments where link access is unencumbered, and air defense threats are relatively nonexistent. The Air Force must focus on real-time domain awareness, enabled by data fusion at the edge of the battlespace, secure data transport, artificial intelligence, and penetrating collection capabilities. Global Integrated Intelligence, Surveillance, and Reconnaissance (GIISR) capabilities must enable and connect to the Advanced Battle Management System (ABMS) as part of the Joint All-Domain Command and Control (JADC2) construct to remain competitive in the high-end fight.

Unlike traditional aircraft employment concepts, the MQ-9 presents capability through combat- air-patrols (CAPs) rather than aircraft number. In the FY22 PB, the Air Force seeks to reduce MQ-9 Government-Owned Government Operated (GOGO) combat lines by 4 (60 combat lines to 56 combat lines). This reduction of combat lines does not equate to reduction in aircraft inventory; no tails will be divested.

The FY22 PB funds existing technology maturation and modernization activities that keep the platform operational and relevant until full-scale divestments begin (planned around FY30). This funding demonstrates the Air Force's commitment to the MQ-9 and the platforms support to the Counter-Violent Extremist Organization mission. However, we must also focus on right- sizing the fleet to enable investments to modernize ISR for the highly contested conflicts of the future. Reduction of combat lines also allows the Air Force to redirect funding towards the completion of studies, analysis, and concept exploration to determine an armed ISR follow-on effort to support the 2030 Force Design.

Significant risks exist without proper divestment of MQ-9 assets. Funding and personnel must support capabilities to win the future high-end conflicts that require accelerated investment. If the Air Force does not modify the MQ-9 force presentation and is required to keep 60 combat lines, it will become more vulnerable and increasingly irrelevant even in low-end conflicts.

The Air Force requests no restrictive language preventing further reduction of MQ-9 combat lines and no additional funding for MQ-9 procurement in FY22.

RQ-4 GLOBAL HAWK

The RQ-4 Global Hawk is a high-altitude, uncrewed, ISR collection platform. While the system has exceptional loiter time and operational reach, the Air Force is moving toward more survivable capabilities that fulfill National Defense Strategy requirements. The Air Force's ability to win future high-end conflicts requires accelerating investment and accepting short-term risks by divesting legacy ISR assets that offer limited capability against peer and near-peer threats. Retiring RQ-4 Block 30s allows the Air Force to field advanced technology while bringing the ISR enterprise into the digital age using modernized sensing grid technologies. The Air Force intends to retire the RQ-4 Block 30 fleet to invest in advanced penetrating

ISR platforms, which will enable the Joint Force to compete and win against a peer competitor in the high-end fight.

The Air Force currently possesses 20 RQ-4 Block 30 aircraft and 10 Block 40 in the inventory. The FY22 PB proposes retirement of the entire Block 30 fleet due to its inability to operate in highly contested environments.

In FY21, the Air Force proposed divestment of the RQ-4 Block 30s; however, Congress non-concurred. Current law requires the Air Force to maintain an RQ-4 fleet until the service can prove the replacement costs are less than RQ-4 sustainment and Joint Reconnaissance Operations Center certifies the capability is greater than RQ-4 for combatant commanders. However, the SECDEF waiver option states that SECDEF can request a waiver if replacement capability is believed to be worth the higher cost.

In the FY22 PB, the Air Force is once again proposing divestment of the RQ-4 Block 30 fleet (20 aircraft) along with the SECDEF approved waiver allowing the divestment. We must look to the future and continue the transition towards a family of interconnected and multi-role systems and sensors for the highly-contested environment that are digitally engineered to increase data processing speed, mission effectiveness, interoperability, survivability, and penetration at a reduced cost.

TANKERS (KC-10, KC-135, AND KC-46)

To maintain our edge in Rapid Global Mobility for the future fight, Air Force must right-size the KC-10 and KC-135 fleets, while continuing to invest in the KC-46. This transition plan requires shedding legacy aircraft and repurposing airmen as KC-46s are delivered. As we move to field the KC-46, Congressional language is restricting retirement of legacy tankers.

The current National Defense Strategy mandates that the Air Force maintain 479 tanker aircraft in its fleet. To achieve the future fleet, the Air Force needs to retire the KC-10 and KC-135 on a one-for-one basis with the KC-46A. Current models and simulations indicate that the Air Force plan to recapitalize aging KC-135 and KC-10s with KC-46As and non-developmental follow-on will meet the 2030+ anticipated aerial refueling demand.

In FY22, the Air Force plans to divest 14 KC-10s (50 aircraft to 36 aircraft), and divest 18 KC-135 (394 aircraft to 376 aircraft). Additionally, adding to capacity and capability, the KC-46 fleet will increase from the 55 aircraft to 71 (+16 aircraft) in FY22. The advanced communication capabilities of the KC-46 will also contribute to advanced command and control (ABMS/JADC2) to enable advanced targeting and battle management.

The Air Force requests approval to continue execution of the tanker transition plan through right-sizing efforts. This will allow us to manage the finite number of aircrews/maintainers and align them with KC-46 Formal Training Unit allocations. In order to do this the Air Force needs to retire KC-135s and KC-10s. With hundreds of personnel tied up in legacy tanker missions, the Air Force will not be able to support and maintain an entire squadron of modern KC-46 aircraft. With these restrictions in place, units will be forced to maintain two sets of aircraft with one set of crews and maintainers. This places a heavy burden on our Airmen, and results in two insufficiently crewed fleets.

C-130H/J

C-130Hs and C-130Js are medium-size transport aircraft capable of completing a variety of tactical airlift operations across a broad range of missions. The fleet delivers air logistics support for all theater forces, including those involved in combat operations. As with other weapon systems, the Air Force is taking acceptable risk in the C-130 portfolio as it focuses resources toward the future force.

In an effort to “Accelerate Change or Lose” the Air Force is focused on modernizing the force at the cost of legacy capabilities to ensure our nation is ready to fight and win in the future. We have taken a measured amount of acceptable operational risk in force structure to appropriately align available resources, inherently increasing aircraft readiness rates and allowing for utilization of fiscal resources on the remaining aircraft to maintain or further improve readiness. Planned right-sizing of the C-130 fleet aims to meet current operational needs while simultaneously investing in technologies that support and advance our concept of victory.

In the FY22 PB, the Air Force seeks to continue right-sizing the C-130H/J fleet to 255 with a net reduction of 8 C-130 aircraft. The Air Force is committed to maintaining all current Air National Guard C-130 units. If any units do transition out of the C-130, we will ensure transition to a mission that supports the future force and has long term viability. Any transition will be mutually agreed upon by the Air Force, the Air National Guard, and the State.

CONCLUSION

The Air Force's FY22 budget submission demonstrates our commitment to balancing near-term risk with readiness. While all platforms once served a purpose, not all will meet the requirements and demands of the 2030 battlespace. We cannot continue the status quo business model; we must make difficult decisions to shed increasingly irrelevant capabilities.

Choosing which technologies we will further develop and take into production is the most difficult decision; as this undoubtedly will create an offset in some current capability and often incurs some unplanned program cost growth. The Air Force must make these tough choices and take calculated risk, seeking to reduce potential inefficiencies where possible, when determining which capabilities have the greatest chance of success against future adversary technologies. China and Russia continue to develop and rapidly field increasingly advanced designs, eating into and eliminating our technological advantages. The Air Force cannot wait to develop advanced systems to fight and win in the ever-changing highly contested environment.

We are committed to making the bold tradeoffs required to answer President Biden's call to "shift our emphasis from unneeded legacy platforms and weapons systems [and] free up resources for investments in the cutting-edge technologies and capabilities that will determine our military and national security advantage in the future," and look forward to working with this committee to mitigate risks as we do so.

On behalf of all Airmen, active, guard, reserve, and civilian, thank you for your leadership and partnership as we build the ready Air Force our Nation needs both today and into the future.

Senator TESTER. Thank you of your testimony, and I appreciate it.

You know, between this hearing and the hearing next week, this is going to give you folks the opportunity to talk about these retirements. And I can tell you that there is not a member on this committee that doesn't get pressure from other members that serve in the Senate, to keep some of these systems. So this is really your opportunity to make your case. And so we appreciate you being here to do exactly that.

Last year there was a lot of controversy about proposals to reduce the C-130 fleet, as well as the Air Force basing plans for new airplanes headed to the National Guards. The President's proposal—the President's budget request plans to divest eight C-130Hs. These planes are only flown by the Air Guard units. And that cut is enough to eliminate an entire Guard unit.

This has created some anxiety, as you can imagine, in Congress. So here are a few direct questions to help clear up what the Air Force is proposing.

Number one, has the Air Force identified a unit that you want to convert to a new mission?

General NAHOM. Sir, thank you for the question. You know, the Air Force is seeking to reduce the C-130 overall inventory from about 300 aircraft down to 255, and we are taking a very measured approach. And for eight aircraft you identify in this year's President's budget, we have not yet identified a unit. We have some replacement missions we are looking at, and we are, we are seeking units that we can come to a mutually agreeable replacement mission.

We are not going to force a unit to change their mission. We think some of these future missions we have to offer are going to be very attractive, and we want to continue to have that discussion and that dialogue with these units.

Senator TESTER. So let me ask you this. Have you narrowed it down at all?

General NAHOM. Well, sir, with the—if you look at, going from 300 to 255, that 45 airplanes, that is about five units.

Senator TESTER. Yes.

General NAHOM. We have already identified one, and we are keeping Martin State and the A-10, and that was actually mutually agreeable. And that works out well.

The second one we are looking at right now is an Air Reserve unit down in Alabama that is going to convert to the MH-139, our newest helicopter and form a training unit down there, again, mutually agreeable.

The next one we are looking at is a cyber warfare wing. And we are looking at a couple of units that could—that this would be very—that this would be very well suited.

Senator TESTER. Okay.

General NAHOM. And we are having the conversations now, but we have not committed to either unit or that actual mission yet, sir.

Senator TESTER. So my next question was going to be, what happens if the home state of a unit disagrees with your decision. And I assume your answer to that, not to put words in your mouth, is that you are hoping that the replacement mission will be attractive enough that they would be willing to give up those C-130s?

General NAHOM. Yes, sir. We were hoping we can actually make some mutually agreeable changes, if not, then we will look elsewhere.

Senator TESTER. Okay. If Congress chooses to continue investing in the newer, C-130Js, how will the Air Force choose to determine where these planes are going to go? And how will that affect the long-term strategy for the C-130 fleet?

General NAHOM. Sir, right now we have—if you stipulate that we go to 255 at some point, right now we have either purchased or ordered 163 C-130Js that are in some form of development. That leaves 92 C-130Hs. We also have money to upgrade those 92 C-130Hs to the level we need to.

So with that being said, right now where we sit, we are actually sitting pretty good with our C-130 investment, if you say we are going to get down to 255. If not, then there would be further investment either in modifying some C-130Hs or purchasing C-130Js. If we do have C-130Js that are appropriated and come to the Air Force, then we will go through our strategic basing process to find the most suitable location to put those aircrafts.

Senator TESTER. Okay. So this question is for either Admiral Crites or General Nahom. Look, savings from legacy divestments should enable the departments to improve efficiency and redirect money to higher priorities. This all depends on the divestment proposals actually delivering on the savings that you guys are planning on.

And so I would tell you that we have been accustomed to cost estimates, for new weapons systems being too low. How would you respond to critics who might say, the estimates of savings of divestments is too high?

Admiral CRITES. Thank you, Senator Tester, for the question. So I think for the Navy, in particular, when we look at our overall funding that is available for us to apply to the different capabili-

ties, the readiness, the items that we need to bring in, we do it very carefully, and what we have seen over the last, really, 10 or 11 years is essentially a flat budget.

We have not kept pace with inflation. And what you will see is, is back in 2010 we had about 288 battle force ships. We declined, as we went through sequestration, down to about 271, and we built our way out of that up to about 297 today. That occurred as a result of a number of reform efforts and divestitures that we did inside the Service.

The challenge that we are facing now is that the good ideas, the things that we don't think we need to bring to the future fight, we are starting to run out of that. And so we are challenged as we see labor costs far exceeding inflation, the cost and the complexity of the work that we are trying to do, the materials that we are trying to buy, are all outpacing inflation, yet we need to balance within the program that we have. And so our priorities have not changed.

Senator TESTER. Okay.

Admiral CRITES. The number one priority is to bring in Columbia. Number two is to ensure that we have a ready force. Number three is to make sure that we are bringing in the capabilities that we need. And number four has been capacity that we can afford.

Senator TESTER. Just a quick follow-up before I turn it over to Senator Shelby. And that is, is that so when you do the divestments that is going to save you X-amount of dollars. When you replace those divestments with other systems, it is going to cost you X-amount of dollars. Is anybody double-checking your math?

Admiral CRITES. Certainly. I mean, we have a number of different groups and organizations that work cost estimating, we work with industry and so forth.

Senator TESTER. Good.

Admiral CRITES. Yes, sir.

Senator TESTER. All right. Thank you.

Senator Shelby.

Senator SHELBY. Thank you, Mr. Chairman.

What metrics did your individual services use to make decisions about how and where to reinvest the savings that you expect to realize from the divestments that you would like to make?

Who wants to start?

General NAHOM. I will start.

Senator SHELBY. General, go ahead.

General NAHOM. Well, Senator Shelby, thank you for the question. Yes, I will tell you where we looked to invest, obviously we start with what we need to look like in the future to meet the threat. And we have done a lot. We have done extensive wargaming on what that fight would look like, and when you do that you can start looking at the Air Force, and looking at what we have, and the aspects of it, that is not going to be part of that fight.

So we use the strategy and the design we need to get to as our first template of where we need to get to. And then you look at some of the legacy platforms. Now, some of the platforms, and that are—that may be not be part of that future fight, we still need in current day operations. So there is certainly a tug between what the combatant commanders need today, and what are our

wargaming and our analysis says we are going to need in the future for that future peer threat.

And we are making those balances every day. And going back to a little bit of what Senator Tester said too, is that when a new weapon system comes on, very often they are coming on slower than we would like. The F-35 is a perfect example. If you go back to 2010 when we were making decisions on our fighter force, we thought in 2021 we would have almost 1,000 F-35s in service, we have about 300. And so therefore we adjust, therefore we take some older systems, we upgrade them, we service life extend as necessary so we can maintain that balance for that current-day operations in that future fight.

Senator SHELBY. Thank you.

Admiral KILBY. Except for this—can I just add for the Navy, sir?

Senator SHELBY. Go ahead, sure. Go ahead, yes.

Admiral KILBY. We are consistent with the Air Force. I would say our POM (Program Objective Memorandum) process introduces analysis and valuation where we really look at key operational problems against the adversary, but particularly China. And we look at their advances from an intel perspective, understand what they are doing from a weapons perspective, and what we see them doing. And we look at our program and balance it against it. And then we have a model-based systems engineering approach to look at those investments that we think, will either accelerate or match the adversary.

So there is a de-emphasis on strongly held opinion, and an emphasis on the analysis and the wargaming that proves these technologies out. So we agree with the Air Force. I think it is critical to do that.

I also agree that these new technologies are hard to develop. So really, in my opening statement, I said, it is not that the things we are talking about divesting are not valuable. They are valuable. They are just less valuable than the things we need to invest in to have a capable force.

Senator SHELBY. Well, what you have got to do, I suppose, is to analyze your current situation, readiness, with the weapon systems of tomorrow, and what our adversaries might do or could do, right?

Admiral KILBY. Yes, sir.

Senator SHELBY. And that is what you are doing, isn't it?

Admiral KILBY. Yes, sir.

Senator SHELBY. Okay. The Navy has procured 35, from my understanding, Littoral Combat Ships, or LCS to date. And now that the ships are almost finished, and many have been delivered to the fleet, the Navy appears to be less interested in them. That said, the Navy has been talking about the need to grow the fleet here before, 355 or more ships for years. But they shift away from the LCS, it seems to me is a contradiction. I don't know.

What is the Navy's assessment of risk if we enter a conflict in the Indo-Pacific region with our current fleet, what is the plan to increase the size of the fleet, if you have one?

Admiral KILBY. Sir, thanks, I will start. The fleet size is an important metric. We have done significant analysis over the last—since 2016 on the fleet size. All those analysis, 2016 when—

Senator SHELBY. But the size is not the only thing.

Admiral KILBY. No, no, sir, absolutely.

Senator SHELBY. But it is the quality of what you have got.

Admiral KILBY. That is right. And I was just talking about, size is not the only thing that matters here.

Senator SHELBY. Okay.

Admiral KILBY. The capabilities that those specific platforms bring, matters. For example, the Flight III DDG brings in the air and missile defense radar that is key against some threats, against China. So in specific comment to the LCS discussion, there are four LCSs that are proposed for divestment in this budget.

LCS-3 and 4, which were the initial versions of the class, and then 7 and 9 are affordability decisions to drive the program where we need to have the most capable Navy we can produce for you. 7 and 9 are cost avoidance for combining gear repair, lethality upgrade, and a survivability upgrade that have not been made on those ships. So really it is looking at what we have and how we best position those, our fleet size against what we need to do, sir.

Senator SHELBY. Thank you. What will the Services do with the equipment that it divests, and what efforts or studies have been done to determine if the newer equipment, such as LCS and RQ-21 might meet other U.S. defense government or allied requirements? Has that been taken into account?

Admiral KILBY. Yes, sir. Different answers for different platforms. The Mark VI is a fairly new platform, just not what we view as capable a platform against China. LCS, as you indicated, is a new platform, so there might be a future for those ships, either foreign military sales or keeping them in some kind of reserve capability. The cruisers on the other hand, are at the end of their service life. So it would be very difficult to come up with a construct where we would be able to bring them out and make them relevant in the time we need to in the adversary, so I think it is a different answer depending on the specific platform, sir.

Senator SHELBY. If you had been given additional resources, we are trying to increase the budget, as you well know, we think—a lot of us believe that the Defense proposal by the administration is too short—too small. But if you had been given additional resources, or if you are given additional resources, which items currently proposed for divestments would you retain because they are relevant to a potential near-peer conflict? Assuming you got all money in the budget, because this is budget-driven, you know that, to a point.

General.

General NAHOM. Yes, sir. I will tell you. We have to be careful, though, with the resources. Money, additional money may be able to allow us to keep an asset. But one of the resources we have to be very careful on, is our people, and as we divest, and I will go back to the fighter example, you know, the same, incredible men and women that are swinging wrenches and flying FA-10s and F-16s today are the same incredible men and women I need flying F-35s tomorrow.

And as we continue to take F-35s through the assembly line, we have got to divest some, otherwise we run into huge manpower problem. So the money is interesting and very important, but the

people piece is actually where I think is the most difficulty when you talk about additional resources, sir.

Senator SHELBY. The one thing you don't want to do is buy yesterday's technology and somebody else is moving ahead of you, do you?

General NAHOM. That is true, sir. And that is why when you look at where we are focused on our platforms, it is absolutely an eye on peer competition. And that is why even some of the stuff that we are divesting out of, there is a market for, building on Admiral Kilby's conversation, like C-130Hs, and even MQ-9s, and other things.

Senator SHELBY. Thank you.

Senator TESTER. Senator Boozman.

Senator BOOZMAN. Thank you, Mr. Chairman. And thank you all for being here. And we greatly appreciate your service to our country.

Both the department of the Navy and the department of the Air Force budget requests look to make significant divestments in order to make necessary changes to their force structure. This committee must ensure that our military has the weapons and the platforms to prevail against the pacing threat of China and Russia.

General Nahom, your testimony clearly paints the picture of why the Air Force needs to modernize. While the average age of the Navy fleet is 14 years, and the Army fleet is 15 years, the Air Force, I believe, is 29 years. One of the Air Force's modernization efforts is with the F-15 fighter aircraft. The President's budget request divests 48 F-15C and Ds in order to procure the modernized successor, F-15EX.

Why is the divestment of F-15C and Ds to procure F-15EX is such an Air Force priority? And how is it in upgrading capabilities? Also, how soon would we see F-15EXs operationally capable of full-spectrum conflict?

General NAHOM. Senator, thank you so much for the question. You know, and the numbers there, the numbers do tell a story. Another number that is very important is 44 percent of Air Force aircraft are flying right now beyond their initial design service life. So we are an aged Air Force and we do need to recapitalize.

The F-15C, I am very familiar with that is the platform where I spent most of my time in the Air Force, and it is falling apart. There is a number of them sitting at Depot down at Warner Robins right now, with additional cracks, looking for dispensation, looking for ways to fix those aircrafts. We have got to refresh the airplanes.

The F-15EX is not the F-15C that I grew up on. We are benefiting from billions of dollars of Saudi Arabia and Qatari investment into that platform to modernize it to a very viable platform for future warfare, especially when you look at what it can do in critical infrastructure defense, defense of the homeland, as well as its ability to shoot and carry outsized weapons for modern combat. So we are very excited about it.

But, for me, I look at it right now as, we have got to get these units and these men and women that are doing incredible work with these F-15Cs/Ds, and places all over the world, whether it is in, RAF Lakenheath, or in Okinawa, Japan, or incredible guardsmen sitting alert today in the F-15Cs, when these airplanes are

flying so far beyond their initial design service life. To get them, new aircraft where they can safely operate and defend our Nation is a huge priority. And the F-15EX is allowing us to modernize a little quicker. We are pretty excited about it coming to service.

Senator BOOZMAN. Very good. General Nahom, our pacing adversaries will never stop advancing, and the Air Force has made it clear that modernization is critical to achieving a future force that is agile, as you just described. Also persistent, resilient enough to win in a great power competition. Maintaining the status quo, no longer suffice, I understand that this—with this comes a need to accept some near-term risks.

General Nahom, what is the Air Force's strategy for balancing near-term risk, and cost when considering divestment options? And then also, we have talked about, you know, concern about divestment and things like that. How does restriction on divestment of specific fleets impact the Air Force's ability to invest in cutting edge technology in the future?

General NAHOM. Sir, thank you for the question. I tell you. When you talk about balancing risk and that is the hardest thing we do, and I am sure my Navy counterparts struggle with this too. The real conversation is really between the Service, in this case the Air Force, and the combatant commands, because it is our combatant commanders that are out there fighting the current-day conflicts right now.

And we have to be sure we are getting them what they need in current-day operations. But we also have to work with them to balance that risk. We have been very successful over the last year, working very closely with TRANSCOM balancing that tanker risk to find out exactly what we need day to day for our air refuelers, but allowing us the resources so we can modernize into the KC-46, and the modifications we need to make the KC-135. So that balance is very important as we look to the future.

Senator BOOZMAN. Thank you. And thank you, Mr. Chairman.

Senator TESTER. Senator Moran.

Senator MORAN. Chairman, thank you.

General Nahom, let me pick up where you and Senator Boozman were visiting, McConnell Air Force Base, the home of the KC-46, and previously the KC, and currently the KC-135s, we take great pride in McConnell and its refueling missions around the globe. The Kansas Air National Guard is sometimes not thought of in that process, but they are refueling, have a refueling mission as well. They fly the 135s, and support refueling missions around the U.S. and across the world.

Let me follow up with what Senator Boozman and you were talking about. As the Air Force seeks to rebalance the divestment of the KC-135s, replacing with the—and fielding the 46s, what safeguards are in place, in this process of transition, to make sure that our mission is being—our missions are being fulfilled?

General NAHOM. Thank you for your question, sir. And that goes back to that conversation with TRANSCOM, and the other combatant commanders, to make sure that we, as an Air Force, can give the day-to-day refueling capacity that is needed, because it is lifeblood of operations around the world. I would say one of the benefits we have in the air refueling, we right now have over 490 tank-

ers, if you can combine in the KC-46, a lot of those tankers are in the Air Reserve proponent, the Kansas Guardsman.

What we are able to do is not only work for the day-to-day capacity. We are also able to work with our guardsmen and our reservists with additional NPA, allowing them to meet some of our day-to-day needs, and then allow us to divest.

The 135 is important, the bigger conversation is the KC-10, as incredible as that airplane is, and any fighter pilot will tell you, they love refueling off the KC-10, because it is an amazing airplane, carries a lot. It is very expensive. And as we phase in the KC-46, it is very important we phase out the KC-10s, and we are on a very roadmap with that right now.

And we have worked out this roadmap with TRANSCOM, and the other combatant commanders, to make sure we can give them enough capacity to mitigate that risk, while we get to the modern fleet, which will be 300 KC-135s, modernized, and 179 KC 46s. And then at that point, once we get to that 179, you will see it—start about a bridge contract, because eventually even those 300 KC-135s will be replaced. We just don't know what that is right now. We know right now, the first 179 will be KC-46.

Senator MORAN. When you say you don't know when, is the expectation that the 35s will generally be replaced with the 46s in the same kind of magnitude and scale?

General NAHOM. They will be replaced because they are aging like any other aircraft. We are going to the first 179, we are going to go to a bridge contract after that, and you are seeing us having those discussions right now with what that is going to look like. And then we are keeping our eyes open to advanced technology.

There may be something else beyond the KC-46, beyond a 767-based platform, to take us into the future. We want to make sure we keep our eyes open. We still have several more years of procurement on the KC-46. So the good thing is we have time to have these conversations, and look at the technologies out there, and make sure that when we get to 179, and we go to Jet 180, and we start replacing the next round of KC-135s, we have the right aircraft.

Senator MORAN. I assume there is no indication or evidence that we are going to need less refueling missions in the future?

General NAHOM. No, sir. I will tell you, if you look at—if your eye is on China, like we all are right here, and you look at the distances in the South China Sea, you have to have the gas. I mean, there are some technologies we can talk about that maybe use less gas in fighters, engine technology, things like that. But overall, we are going to need the gas in the air.

Senator MORAN. Should I have any concern about the Guard units, as this transition is pursued, that they will lose their refueling mission?

General NAHOM. No, sir. There is no intention in that right now, sir.

Senator MORAN. So you wouldn't expect any specific, National Guard units to be involved in a divestiture process that would take them out of their mission?

General NAHOM. No, sir. Especially not in the refueling, we need the air refuelers. You know, one of the questions you will see com-

ing out as we look at ops, the next two beddown locations for the Air National Guard, we are actually going to have that conversation in the next year. And of the Air National Guard units flying the KC-135 now, we are going to transition two of those as part of that 179, and that conversation will happen in the coming year.

Senator MORAN. General, thank you.

General NAHOM. Sure.

Senator TESTER. Senator Hoeven.

Senator HOEVEN. Thank you, Mr. Chairman. And thanks to all three of you gentlemen, for being here, and for your service, it is much appreciated.

General Nahom, last year we agreed to retire the Block 20 Global Hawk. I am wondering, is there a current plan for those airplanes? I have heard possibly support testing hypersonic missiles. But is there a plan for those Block 20 airplanes?

General NAHOM. Sir, I am not aware of any plan. You are probably aware that we actually extended them a few months to assist in the withdrawal from our Afghan Forces. But anything beyond that, I will have to take that for the record, and ensure I have that correct, sir.

Senator HOEVEN. Thank you. Okay. This year you are requesting permission to retire Block 30 fleet, that is still under consideration, let us say. And so my question is, are you able to replace the capabilities of Block 30 fleet immediately, if in fact we did go with your request on that?

General NAHOM. Sir, if you look at what the Block 30s are doing today. They do it very well. That is one of these places where you look at some near-term risk to make sure we get to the fleet we want. There is some capacity that they provide to the joint users, the combatant commands out there, that we will have to mitigate with other technologies.

But when you look at the future where we are going, the Global Hawk, because future ISR (Intelligence, Surveillance and Reconnaissance) platforms, we have to—you know, the three things that are most important is an ISR platform that can survive in the threat, persist in a threat, and then be connected. And the Global Hawk, because it was designed—it was not designed with the threat we are looking at right now from a resurgent China, we have to look to the future in that. And that is where that risk with the combatant commanders comes in, sir.

Senator HOEVEN. Have you looked at strengthening the survivability of the aircraft? Have you looked into that?

General NAHOM. Sir, just the nature of that aircraft, the altitude it flies, and then it—I will have to get back to you in a classified session on that question. I will take that for the record. But right now, when you look at that platform, the speeds it flies, the altitude that it flies, and the makeup of the aircraft, it is just not survivable in these contested environments that we are going to be looking to gather intelligence from in the future.

Senator HOEVEN. Are you making any plans to retire the Block 40?

General NAHOM. Sir, the Block 40 right now is a little bit different mission, because we actually rely on it for the GMTI, the ground moving target indicator capability. We also rely on the E-

8 J STARS. We are going to retire a couple of J STARS because that airplane is really showing its age. We are going to need the Block 40s in the interim until we get to the “what next”, and we will have to come back in a classified session to talk about that more.

But the Block 40s are going to be very critical in the next 6, 7, 8 years while we go to the “what next”, and that capacity will be important for the combatant commanders, sir.

Senator HOEVEN. What is your rationale for curtailing purchase of the MQ-9?

General NAHOM. The MQ-9 right now, sir. We have over 300 platforms. We have enough platforms of the MQ-9 to take us into the mid-2030s. We are not reducing the size of the fleet—of the squadrons. We are not reducing any manpower out of those squadrons. What we are asking for is to reduce some of the combat lines in the manner in which we have been flying them in the Middle East.

The way we have been flying the MQ-9, as amazing as that platform is, we operate in a very manpower-intensive way. So we are looking to reduce some of the combat lines and start operating that aircraft a little differently. If you look at how many platforms we have, over 300, we just don’t need additional platforms right now for the size of the enterprise we have in the Air Force.

Again, it is one of those that is a balance too, because the MQ-9, as incredible as it is for some of the current-day operations, certainly things we do in the Middle East, it is not survival. It was never designed for what we foresee operations in the South China Sea, where the peer adversary would be.

Senator HOEVEN. So what are you going to replace it with?

General NAHOM. Sir, that we have a family of systems, I will have to come back to you in a classified setting to talk more details about some of the platforms and some of the capabilities we are bringing on, but we were certainly, if you look at what the MQ-9 brings to the warfighter today, we are certainly looking to make sure that we as an Air Force provide that level of ISR to the combatant commands in the future.

Senator HOEVEN. And I understand the concern with survivability, particularly relative to the near-peer adversaries. So I certainly understand that. But I also understand that there is always a demand for ISR out there.

General NAHOM. Yes, sir.

Senator HOEVEN. You always have a demand for more ISR.

General NAHOM. Yes, sir. Absolutely—

Senator HOEVEN. That is accurate, isn’t it?

General NAHOM. Absolutely accurate, and that is why we are not taking any crews out of it. We are going to transition as smartly as we can move in forward. I do believe though, the reduction in the combat lines, because of our reduction of our presence in the Middle East is appropriate. Now we will have the opportunity to look at those platforms differently and use them differently in competition, and in some of these places around the world with less contested environments.

Senator HOEVEN. Thank you, General. And I look forward to visiting with you further on this.

And to both of the gentlemen from the Navy, thank you for your use of unmanned or drone aircraft. I think it has been very effective, and I think you are doing a great job with it, and it is much appreciated.

Again, General, thank you for the conversations we have had on this subject, and look forward to talking to you more on it.

Senator TESTER. And Senator Hoeven, next Wednesday, we are going to be having a hearing in classified that you can take all those questions back, and rock and fire with these guys.

Senator HOEVEN. Thanks, Mr. Chairman.

Senator TESTER. Yes.

Senator HOEVEN. I appreciate both you and the ranking member, thanks very much.

Senator TESTER. Senator Murkowski.

Senator MURKOWSKI. Thank you, Mr. Chairman.

Gentlemen, good morning. Thank you all for your leadership.

General NAHOM, I understand that prior to my arrival here at the committee, you had discussion with Senator Moran regarding the KC-135s. And I wanted to just follow on to that conversation.

We have been notified, four additional KC-135s that will join the fleet at Eielson, we are looking forward to that. We are very thankful for the continued partnership that we have in Alaska. I am also very aware of the Air Force's plan to divest the KC-135s as the KC-46s are available, recognizing that we have got an aging fleet up there.

So the question for you this morning is with regards to timeline of when the divestiture of the KC-135 would affect Alaska, and when the delivery of the KC-46 might happen?

General NAHOM. Senator, well thank you for the question. You know, right now we are very focused on Alaska and these additional tankers. This is a really good new story for the Air Force. We need additional refueling capacity because the amount of—I mean, it is the center of fifth-generation warfare in higher Air Force, with what is going on up at Eielson with the F-35, and certainly with the plus-up of F-22s down in Anchorage.

Getting more for refueling capacity has been our most immediate need. And that is why those additional four, and we are committed to getting those four tankers there as quickly as possible. We are just trying to build—we are assessing and building the infrastructure around them to make sure that we can take care of the mission, the added mission, as well as the airmen we send up there.

Right now as we—the KC-135s are going to stay there until we can replace them with something. We need refueling capacity in Alaska, not just for the training on the JPARC, but also to project the power of those platforms around the world. And in that, in having that refueling capacity there immediately is game-changing for us.

Now when we go to the KC-46, we are going to look at the next two KC-46 locations for the Air National Guard in the next year. We will assess all the locations to make sure we find the most suitable location, and that will go through our normal strategic basing process.

Once we get to 179 of those airplanes, we will start—we are going to look at a bridge contract, and then we are going to look

at a follow-on tanker, to see what is the most suitable. Eventually, those KC-135s will be replaced. Eventually they have to, they are aging like any other platform in the Air Force.

When that is and what that platform is, whether it is the KC-46 or some other refueler that I cannot tell you right now. I do know that we will have robust refueling capacity in Alaska until that point, and then we are going to continue on with a new platform. I just don't know exactly when that time will be, ma'am.

Senator MURKOWSKI. But it looks like you are very, very focused on making sure that we don't have this gap that, in fact, we will be able to—whether it is utilizing, perhaps KC-46s, in kind of a rotation in and out in the interim, you are looking at all of these as potential consideration?

General NAHOM. Yes ma'am. And, you know, if you look at Alaska too, and what you need from that, if you look at the Pacific and how quick things can happen in the Pacific, we need to get air power to places around the world instantaneously, and sitting up there at Anchorage, or sitting up there at Eielson, waiting for a tanker to come from Kaunas, is not going to help us when we need to get air power out immediately.

And having the fifth-generation aircraft there to train at that incredible range is wonderful, but then we have to be able to get it out quickly. And so the additional four tankers and increasing air refueling capacity, Alaska is one of the better moves we made in the last year?

Senator MURKOWSKI. Well, you know, how much I—I know you have heard this from Senator Sullivan, but we all recognize that this is key. We can put the assets out there, but if you can't fly them around because you don't have the fueling, refueling capacity, we have not helped anyone.

Let me switch subjects real quickly. And this relates to ice-breakers, Polar Security Cutters, you all know that we have made some good investments, and momentum with the Polar Security program. We want to make sure that we are maintaining that course. But as we are looking to divest, to invest, if you will, in new technologies and platforms, how are you incorporating the Arctic domain into the planning here? And, you know, we recognize that the Navy is certainly going to benefit from increased Coast Guard, Polar Security Cutters, do you need more assets up north to bolster your maritime domain awareness in this region?

Admiral KILBY. So, ma'am, I will start. And I will ask Admiral Crites to come in if he wants to add anything. But as we think about new platforms, like DDG(X), understanding that operating environment, and the reach, and where the adversary is potentially going to be is critical for us. So we have to make that as part of the design criteria when we develop that ship based on our wargaming and analysis, and where we think we are going to operate.

It looks to me like there is a couple of drivers for that new hull form, one of them is potentially firing a conventional prompt strike missile, or something like that, which will require it to operate in different areas than we have in the past, and perhaps present opportunities for us.

So we would certainly include all those operating environments in that structure as we kind of work through that. But DDG(X) is an important ship for us in the future, because we need to create a ship that can be modernized. And the Flight III is an awesome ship. It is going to be the best ship in the world when we produce DDG-125. The availability of service life allowance from an HM&E perspective, hull mechanical and electrical perspective, to upgrade it to additional sensors is challenging.

So we need a platform that can have the reserve to be updating and supportive of new things. So I think that will be a first opportunity for something forward-fit in the future in the combatant realm for us to do that. Of course, our submarines operate all over the world and provide us great access.

Anything to add, Admiral Crites?

Admiral CRITES. Yes, ma'am, thanks for the question. I would just say that we strongly support the Coast Guards' icebreaker fleet, as well as Polar Security Cutter. We have got some good investments in 2022 associated with the Arctic, some good investments in R&D that is tied to autonomous systems, and sensing, as Admiral Kilby mentioned, submarine presence and our ability to operate up there is important.

The National Defense Strategy that is being worked now, there will be additional direction, I think, provided in that document. The Secretary of Defense had highlighted that I think in his testimony recently, and we are looking forward to seeing that. But it is absolutely important, and we are certainly focused there, and looking at our strategy with the Coast Guard.

Senator MURKOWSKI. Appreciate that.

Admiral CRITES. Yes, ma'am.

Senator MURKOWSKI. I recognize that the Secretary is going to be up in Alaska, up in the Eielson area, over the weekend on the way to other points, so I think it is his first trip as Secretary, and we are looking forward to his positive review afterwards.

Thank you as chairman.

Senator TESTER. Thank you. I just have one quick follow-up question, and it follows up on something that Senator Shelby had asked you guys that I think is very important. And that is, how many of these proposals are divestments due to saving money versus weapons that are simply past their prime?

Admiral KILBY. So it is a mix, sir. Cruisers are ships that we value greatly and were originally designed for 30 years. So of the ships that we are considering divesting of in this budget, many of those were produced in the last budget, two are presented in this budget, Hue City and Anzio.

So those are not, I would say, totally affordability-driven, they are maintainability-driven, and relevance-driven. There are some other investments, though, that we talked about that are younger, that we could get more service life allowance, that we made a decision, based on their capabilities, that they would be less relevant, but there is certainly hull life left on those.

Senator TESTER. Okay.

General NAHOM. And sir, from the Air Force. I would, I would say that we are not divesting anything that we would need for a peer fight. We are certainly, because of the budget, we are buying

things at a slower rate than we would like, fighters are a perfect example, we are not buying fighters fast enough to replace the fighters that are falling off due to age.

I would say, based on the budget, though, we are divesting some systems that we could use in the interim to fill in some of that capacity that the combatant commanders need. And that is what we are—that is that risk piece, but we are still trying to create that Air Force that we believe that the Nation needs to defend our interests in the coming decades.

Senator TESTER. Senator Shelby.

Senator SHELBY. General, at what point—I know you have to think about this—will we get to where, looking at the risk in the world to us and our allies, that we had better be careful what we, not only divest, but how much we get for the future? Is that a thought sometimes, every day?

General NAHOM. Absolutely, sir. I am not—and I am always concerned what we divest, because I know the combatant—what the combatant commanders and our airmen need around the world. I am very concerned with readiness, that we are not investing in readiness right now, the one of my bigger concerns. But I will tell you, I am very concerned with what we are not with—you know, when we are talking about, you know, B-21s, or the next-generation air dominance, you know, some of these things are not going to be in service for 10, 12 years.

And, you know, we have got to make sure that we continue the investment, so they do arrive. We cannot afford to bring on the B-21 and have that—that bomber is going to be critical to our Nation's defense. And we cannot do what we did with the B-2 and only buy 20 of them. We have got to make sure that we stay invested in these systems moving forward. And that is a concern, sir.

Senator SHELBY. But we have to stay looking long-term at the future, knowing China is a long-term thinker and implementer, long-term. They sit in readiness, but the answer is in tomorrow, and tomorrow, aren't they? Are they not?

General NAHOM. Yes, sir. We obviously need to look at the threat. And I will say the thing that gives me the most pause when you look at the threat, you know, I have been asked, you know, did the NDS (National Defense Strategy) back in 2018, get it right? And I would say, yes but, I would say the threat is accelerating much more than we would have thought back in 2018.

Senator SHELBY. But we also have to think, where are we going to be in 10 years.

General NAHOM. Yes, sir.

Senator SHELBY. Because we think the Navy has always thought, the Air Force did and the Army did, but the Navy, especially, because of the cost and time to build ships and submarines. So you have got to think of, say, 10 years from now, or even 20 years. The Chinese though have the economic base that the Soviet Union never had as far as the future wealth to—as a nation. You can see it coming. I mean, it is there, whether you like it or not. Is that true?

General NAHOM. Yes, sir. I would say they have some advantages, as do we. You know, we, we have a lot of partners and allies

out there that other nations don't—or that China does not have. You know, recently we had exercise——

Senator SHELBY. We do today, but we have got to think of where are we going to be, say, 10 years from now, or 20 years.

General NAHOM. Yes, sir. Absolutely.

Senator SHELBY. Because they are, by nature, pretty patient, aren't they?

General NAHOM. Yes, sir. You know, there are signs that, you know, are very positive. You know, when you look at an exercise where you have, Italian, British——

Senator SHELBY. Yes.

General NAHOM [continuing]. Israeli, and U.S. Marine—U.S. Air Force, U.S. Marine, the F-35s, all operating together in a single exercise, that is something our adversaries cannot match. And I think there is some power in that. And I think, as we look to the future, not just the investments, we look at our partners and allies, and then we talk a lot about in the Air Force about the Advanced Battle Management system, and how that relates what the Navy is doing with overmatch, and the joint, all-demand, command and control system, and how we share data, and how we modernize together. I think there are—that we are doing—we are making good investments as we look to the future, but it is certainly something to keep an eye on. Thank you.

Senator TESTER. Thank you.

Senator Shelby.

We, appreciate your testimony here today. Senators may submit additional written questions and we asked if that happens, that you respond to them in a reasonable amount of time.

This conversation is going to continue next week. This Defense Subcommittee will reconvene on July 28, which is a Wednesday at 10 a.m. It will be in closed session to examine the next-generation weapons systems in the fiscal year 2022 budget request.

CONCLUSION OF HEARINGS

Senator TESTER. Thank you, guys. I assume you are going to be at the hearing next week. So we will see you then.

With that, this committee stands in recess.

[Whereupon, at 10:57 a.m., Wednesday, July 21, the hearings were concluded, and the subcommittee was recessed, to reconvene subject to the call of the Chair.]

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 2022

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

[CLERK'S NOTE.—The subcommittee was unable to hold hearings on nondepartmental witnesses. The statements and letters of those submitting written testimony are as follows:]

NONDEPARTMENTAL WITNESSES

PREPARED STATEMENT OF THE COALITION FOR NATIONAL SECURITY RESEARCH

Dear Chairman Tester and Ranking Member Shelby, and distinguished Members of the subcommittee, thank you for the opportunity to submit outside witness testimony as you begin to craft the fiscal year (FY) 2022 Defense Appropriations bill. The Coalition for National Security Research (CNSR) (<https://cnsr4research.org/>) is a broad-based alliance of more than 100 members from industry, academia, scientific and professional associations, and non-profits conducting vital scientific research to create new and improve existing technologies and capabilities to support the U.S. Department of Defense's (DoD) operations.

With nearly 70 percent of Research, Development, Test and Evaluation (RDT&E) conducted extramurally,¹ DoD relies on its partners such as CNSR members to perform the RDT&E that will provide the Department the technologies and capabilities it needs to secure our national security. If the United States military is to maintain its technological advantage during great power competition, it is imperative that we make robust investments in the Defense Science and Technology (S&T) enterprise, including strengthening the future defense workforce. As noted by the Defense Science Board (DSB), lower funding levels for Defense S&T could threaten the dominance of the U.S. military.²

FISCAL YEAR 2022 BUDGET REQUEST FOR THE DEFENSE S&T PROGRAM

The Biden-Harris Interim National Security Strategic Guidance states that the United States will double down on science and technology investments and support cutting-edge technologies and capabilities that will advance our military and national security in the future.³ In addition, the National Defense Strategy (NDS) calls for establishing an unmatched twenty-first century national security innovation base and sustaining Joint Force military advantages.⁴ Unfortunately, the FY 2022 budget fails to meet the commitment in the Interim National Security Strategic Guidance and request the appropriate resources to implement the NDS.

While the budget requests the RDT&E top line ever, it simultaneously calls for cutting Defense S&T funding within the larger portfolio by 13% or more than \$2.1 billion. The budget also requests cutting defense basic research, the type of research that makes discoveries to enable future technologies and military capabilities, by 14.5% or more than \$388 million. With China investing three times more annually in R&D than the U.S. and likely to be the world's top R&D performer in the near

¹ <https://ncses.nsf.gov/pubs/nsf21329>.

² <https://dsb.cto.mil/reports/1990s/DefenseScienceandTechnologyBaseforthe21stCentury.pdf>.

³ <https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/03/interim-national-security-strategic-guidance/>.

⁴ <https://dod.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf>.

future,⁵ now is not the time to cut funding for the DoD's primary programs that create new technologies and capabilities—as well as to help train the next generation defense workforce—to ensure the U.S. military maintains its global dominance.

The FY 2022 budget proposes more than just cutting the Defense S&T program below FY 2021 Congressionally enacted levels, it proposes to cut certain research programs below levels requested in the FY 2021 budget request. More specifically, DoD requested fewer resources compared to its last budget request for overall 6.1 defense basic research; Army University Research Initiatives; Army applied research; Navy basic research; Air Force basic research; Air Force applied research; DTRA Basic Research Initiatives; and Defense-Wide basic research. This de-emphasis on supporting the kind of research that maintains our technological and strategic advantage over adversaries developing advanced capabilities puts the military at a competitive disadvantage. Condoning this proposed budget will have many negative, sustained implications for our national security in the short-term and long-term.

CNSR urges Congress to reject cuts requested in the FY 2022 budget for the Defense S&T program and increase funding by least 6% over FY 2021 consistent with the recommendations from the National Defense Strategy Commission;⁶ DSB;⁷ National Security Commission on Artificial Intelligence (NSCAI);⁸ National Academies;⁹ Center for a New American Security (CNAS);¹⁰ House Armed Services Committee's Future of Defense Task Force;¹¹ Council on Competitiveness;¹² and American Academy of Arts and Sciences.¹³

DEFENSE BASIC RESEARCH PE RECOMMENDATIONS

For decades, the defense basic research programs have provided the scientific breakthroughs to give the warfighter the weapons and infrastructure needed to succeed. Capabilities that help ensure our national security—such as advances in hypersonics testing, various quantum technologies, semiconductors critical to defense radar systems, solar cell efficiency, laser technologies, stealth capabilities, night vision, GPS, sonar, radar, precision munitions, biosensors, and near-real-time delivery of battlefield information—all derive from defense basic research.

We offer the following recommendations for the key defense basic research PEs that serve as the foundation of the defense innovation pipeline necessary to maintaining the U.S. military's global technological superiority.

[\$ in thousands]

Agency—RDT&E	Program Element (PE)	FY21 PBR	FY21 Enacted	FY22 PBR	CNSR FY22 Request
Army	Defense Research Sciences	\$303,257	\$367,457	\$297,241	\$389,504
Army	University Research Initiatives	\$67,148	\$97,148	\$66,981	\$102,977
Army	University and Industry Research Centers	\$87,877	\$121,877	\$94,003	\$129,190
Army	Cyber Collaborative Research Alliance	\$5,077	\$5,077	\$5,067	\$5,382
Army	Artificial Intelligence and Machine Learning Basic Research	N/A	N/A	\$10,183	N/A
Navy	University Research Initiatives	\$116,816	\$144,816	\$117,448	\$153,505
Navy	Defense Research Sciences	\$467,158	\$489,984	\$484,421	\$519,383
Air Force	Defense Research Sciences	\$315,348	\$325,348	\$328,303	\$344,869
Air Force	University Research Initiatives	\$161,861	\$196,861	\$162,403	\$208,673
Air Force	High Energy Laser Research Initiatives	\$15,085	\$15,085	\$0	\$15,990
Defense-Wide	DTRA Basic Research Initiatives	\$14,617	\$14,617	\$11,828	\$15,494
Defense-Wide	Basic Research Initiatives	\$35,565	\$75,565	\$39,828	\$80,099
Defense-Wide	National Defense Education Program	\$100,241	\$137,241	\$112,195	\$145,475

⁵ <https://ncses.nsf.gov/pubs/nsb20203>.

⁶ <https://www.usip.org/sites/default/files/2018-11/providing-for-the-common-defense.pdf>.

⁷ <http://www.dtic.mil/dtic/tr/fulltext/u2/a403874.pdf>.

⁸ <https://www.nscai.gov/wp-content/uploads/2021/03/Full-Report-Digital-1.pdf>.

⁹ <https://www.nap.edu/catalog/11463/rising-above-the-gathering-storm-energizing-and-employing-america-for>.

¹⁰ <https://www.cnas.org/publications/commentary/sharpening-the-u-s-militarys-edge-critical-steps-for-the-next-administration>.

¹¹ <https://armedservices.house.gov/—cache/files/2/6/26129500-d208-47ba-a9f7-25a8f82828b0/6D5C75605DE8DDF0013712923B4388D7.future-of-defense-task-force-report.pdf>.

¹² <https://www.compete.org/reports/all/202>.

¹³ https://www.amacad.org/sites/default/files/publication/resources/Perils-of-Complacency_Full-Report_1.pdf.

UNIVERSITY RESEARCH INITIATIVES

The FY 2022 budget request would cut University Research Initiatives (URIs) by more than 20% which means funding at levels below 2005, adjusted for inflation. Given that universities and colleges perform the majority (55%) of DoD-funded basic research,¹⁴ the type of research that creates paradigm shifts in DoD's technological capabilities, cutting URIs this significantly will not only harm defense innovation efforts, but also workforce development since basic research funding often attracts the most creative minds in fields of critical interest to DoD.¹⁵

A program within URIs, the Multidisciplinary University Research Initiative (MURI) regularly produces revolutionary new military technologies and has become an essential skunkworks for create innovation.¹⁶ Unfortunately, the FY 2022 budget request proposes to fund MURIs at levels below FY 2005, adjusted for inflation. This will only exacerbate the fact that the program is already dramatically underfunded. According to DoD, the MURI program received 365 proposals in FY 2020 but was only able to make 26 awards—leaving 339 proposals unfunded including 32 potentially game-changing research projects that were determined to be worthy of funding but were not due to a lack of appropriations. Not funding potentially revolutionary defense scientific research will hurt our ability to maintain global military technological superiority.

In addition, the situation is similar for the Defense University Research Instrumentation Program (DURIP), which provides infrastructure and equipment support to build universities' capacity to conduct defense-relevant research. The FY 2022 budget request proposes to fund DURIP at levels below FY 2010, adjusted for inflation, further underfunding this program. According to DoD, the DURIP program received 724 proposals in FY 2020 but was only able to make 172 awards—leaving a staggering 552 proposals unfunded including 229 critical infrastructure and equipment projects that were determined to be worthy of funding but were not funded due to a lack of appropriations. If universities and colleges do not have the infrastructure and equipment necessary to do unique defense research, the DoD will potentially lose its biggest source of support for developing new capabilities.

MINERVA RESEARCH INITIATIVE

The Minerva Research Initiative is DoD's signature social science basic research program that funds university-led teams to address problems of strategic importance to U.S. national security. As noted by DoD officials, because many national security challenges are driven by complex social dynamics, Minerva is an important source of new ideas to better understand social, behavioral, cultural, and political considerations that are inherent to our security and stability. Despite its importance, the FY 2022 budget request cuts funding for Minerva from \$17 million to only \$4 million within the Defense-Wide Basic Research Initiatives PE.

This cut is shortsighted for two main reasons. First, Minerva's research is aligned with and critical to carrying out the NDS in support of Department-wide priorities. Recently funded Minerva projects, such as "Russian Disinformation and Propaganda Campaigns" and "Empirical Analysis for Meeting Great Power Challenges" have given DoD unique insights that help shape future national security policies and better position the warfighter to navigate a complex global environment. Second, Minerva is another underfunded defense basic research program. According to DoD, in FY 2019, Minerva received 180 applications but only funded 15—at least 6 projects were determined to be worthy of funding but were not funded due to a lack of appropriations.

DEFENSE APPLIED RESEARCH PE RECOMMENDATIONS

Basic scientific research is just the first step in creating new or improving existing military technologies. Researchers, scientists, and engineers must apply the fundamental knowledge learned from basic research to solve complex military problems and develop the systems and components for potential solutions. To that end, we propose to highlight the success of the Defense-Wide Manufacturing Science & Technology PE, which the FY 2022 budget requests cuts of 45%. This PE provides DoD's contributions to the Manufacturing USA Institutes that help move discoveries from the nation's universities and research laboratories to the defense industrial base while strengthening the U.S. workforce. For example, DoD-funded institutes have demonstrated enhanced heat exchange capabilities for additive manufacturing, ad-

¹⁴ <https://nces.nsf.gov/pubs/nsf21329>.

¹⁵ <https://dsb.cto.mil/reports/2010s/BasicResearch.pdf>.

¹⁶ <https://www.ida.org/idamedia/Corporate/Files/Publications/IDA.../STD/D-5361.pdf>.

dressed cybersecurity supply chain issues, reduced weight of armor for military ground vehicles, and developed a first-of-its-kind advanced functional fiber to enable underwater communications.¹⁷ In FY 2019, the Manufacturing USA Institutes conducted 561 major applied research and development projects of high priority to broad industry sectors. In addition, the network had more than 32,000 workers and students participate in education and workforce development activities. The Manufacturing USA Network is an example of a program supporting implementation of the NDS to enhance the domestic manufacturing and the defense industrial base. In order to ensure that discoveries made through basic research are translated into practical military technologies and capabilities, we offer the following recommendations for our priority applied research PEs.

[\$ in thousands]

Agency—RDT&E	Program Element (PE)	FY21 PBR	FY21 Enacted	FY22 PBR	CNSR FY22 Request
Army	Lethality Technology	\$42,425	\$108,925	\$64,126	General Support
Army	Soldier Lethality Technology	\$125,435	\$204,435	\$105,168	General Support
Army	Ground Technology	\$28,047	\$154,047	\$56,400	General Support
Army	Next Generation Combat Vehicle Technology	\$217,565	\$265,565	\$172,166	General Support
Army	High Performance Computing Modernization	\$188,024	\$228,024	\$189,123	General Support
Navy	Marine Corps Land Force Technology	\$50,623	\$55,623	\$51,112	General Support
Navy	Common Picture Applied Research	\$48,001	\$43,703	\$51,477	General Support
Navy	Warfighter Sustainment Applied Research	\$67,765	\$116,255	\$70,547	General Support
Navy	Electromagnetic Systems Applied Research	\$84,994	\$92,994	\$85,157	General Support
Navy	Ocean Warfighting Environmental Applied Research	\$63,392	\$80,284	\$70,086	General Support
Navy	Future Naval Capabilities Applied Research	\$167,590	\$170,724	\$173,356	General Support
Navy	Manufacturing Technology Program	\$60,122	\$60,122	\$57,263	General Support
Navy	Advanced Undersea Prototyping	\$115,858	\$89,812	\$58,473	General Support
Air Force	Materials	\$140,781	\$238,281	\$113,460	General Support
Air Force	Human Effectiveness Applied Research	\$115,222	\$134,122	\$136,273	General Support
Air Force	Aerospace Sensors	\$211,301	\$233,301	\$174,683	General Support
Air Force	Directed Energy Technology	\$128,113	\$130,613	\$121,869	General Support
Air Force	Dominant Information Sciences and Methods	\$178,668	\$215,668	\$169,110	General Support
Air Force	High Energy Laser Research	\$45,088	\$29,208	\$0	General Support
Defense-Wide ...	Cyber Security Research	\$15,255	\$25,255	\$15,380	General Support
Defense-Wide ...	Defense-Wide Manufacturing S&T Program	\$93,817	\$245,817	\$134,022	\$260,566

DEFENSE ADVANCED RESEARCH PROJECTS AGENCY (DARPA) RECOMMENDATIONS

DARPA's ability to create truly revolutionary new capabilities is well documented. AI, microelectronics, speech recognition, touchscreen displays, unmanned aerial vehicles, and advanced wireless capabilities all stem from DARPA-funded research. DARPA has worked with the academic community to create the Internet, computer chips critical to AI systems, self-driving cars, stealth technologies, metamaterials, and neuro-prosthetics. More recently, DARPA's research was partially responsible for developing RNA-based vaccines, which have been critical in the global response to COVID-19.¹⁸ It is safe to say that the world would be a different place without DARPA-enabled research. CNSR strongly supports robust funding for DARPA. We recommend a funding level of \$3.7 billion for DARPA to continue supporting game-changing scientific research.

Again, thank you for the opportunity to submit outside witness testimony as you develop the FY 2022 Defense Appropriations bill. Please do not hesitate to contact us if we can be of any assistance during the FY 2022 appropriations process.

PREPARED STATEMENT OF THE CONSORTIUM FOR OCEAN LEADERSHIP

On behalf of the Consortium for Ocean Leadership (COL), which represents our nation's leading ocean science, research, and technology organizations from academia, industry, and the larger nonprofit sector (to include philanthropy, associations, and aquariums), I appreciate the opportunity to submit for the record our fiscal year (FY) 2021 funding priorities for the Department of Defense (DOD).

¹⁷ <https://www.nist.gov/publications/manufacturing-usa-20192020-highlights-report>.

¹⁸ <https://www.appropriations.senate.gov/imo/media/doc/Tompkins%20Statement%20For%20The%20Record.pdf>.

The United States is a maritime nation whose military and national defense are essential, not only to the security of our own country, but to the stability of global democracy. A key component of this continued success is our military's technological superiority, which has provided superior weapons and systems that offset size and geographic advantages of potential adversaries for more than 70 years. This extends to our dominance in the ocean environment. The late Admiral James D. Watkins, chief of naval operations from 1982–1986, used to stress that our superior knowledge of the undersea domain gave the United States the competitive advantage necessary for our victory in the Cold War.

Do we have that same competitive advantage in oceanography—which lets us understand the undersea environment to outcompete an adversary today? As other nations, such as Russia and China, increase their investments in ocean-related research and development (R&D) spending, they threaten our leadership in this sector, which was once second to none. Advances in technology are necessary for us to observe, monitor, map, explore, and characterize our undersea environment; without those capabilities, we cannot maintain our competitive advantage. As a way to address the eroding competitive advantage in ocean science, the Navy established Task Force Ocean (TFO).

However, it is not just in the undersea domain where our science- and technology-induced dominance is eroding. This same runs true for our overall technological advantage, with DOD leaders testifying to other nations meeting and beating the United States in innovative and strategic capabilities. There are many who believe our gap in leadership is closing due to multiple factors, including both changes in composition of research and development funding as well as the growing technological skills of potential adversaries. While there are many efforts that must be taken to maintain our technological advantage (TFO being just one of them), one consideration that has been raised is the adequacy of DOD's investments in Research, Development, Test, and Evaluation (RDT&E).

While the president's budget request for FY 2022 includes a request for the largest increase ever for the RDT&E top line (4.5% over FY 2021 funding levels), this does not extend to the science and technology (S&T) budget within RDT&E. The S&T budget request includes a steep 13% decrease for the S&T budget compared to FY 2021 enacted levels, with basic research (6.1) and applied research (6.2) seeing a 14.5% decrease and advanced technology development (6.3) dropping 11.1%. Similar decreases are proposed within Navy's budget but with an 11.9% overall decrease to S&T: 8% for basic research, 17.5% for applied research, and 7.2% for advanced technology development.

These dramatic decreases in S&T funding would impact our nation's military superiority and our technological edge, and COL echoes the concerns and requests from testimony submitted by the Coalition for National Security Research (CNSR), which includes more than 100 members from industry, academia, scientific and professional associations, and nonprofits that advocate for a strong Defense S&T enterprise. As stated in CNSR's testimony, "With China investing three times more annually in R&D than the U.S. and likely to be the world's top R&D performer in the near future, now is not the time to cut funding for the DoD's primary programs that create new technologies and capabilities—as well as to help train the next generation defense workforce—to ensure the U.S. military maintains its global dominance."

I respectfully request the subcommittee reject the proposed Defense S&T cuts and instead increase funding by at least six percent over FY 2021 levels, in accordance with the CNSR request, which is consistent with recommendations from the National Defense Strategy Commission, the National Academies, the House Armed Services Committee's Future of Defense Task Force, and many others. I'd also like to highlight funding priorities for several program elements (PE) important to our defense ocean science and technology enterprise.

Defense Basic Research: University Research Initiatives

DOD supports basic research to advance fundamental knowledge in fields relevant to national defense. To accomplish this work, DOD has a strong relationship with academia, with universities and colleges performing 55% of DOD-funded basic research. The University Research Initiatives (URI) exist across the services to improve the quality of research and to support scientists and engineers necessary for our national defense needs. The proposed 20% cut to URI funding across the Army, Navy, and Air Force would put funding, when adjusted for inflation, at lower than 2005 levels. For Navy URI specifically, the budget request proposes an 18.9% decrease.

One of the Navy URI programs, the Defense University Research Instrumentation Program (DURIP), is a competitive annual grants process that supports university research infrastructure, including instrumentation essential for cutting-edge re-

search, that is necessary for high-quality research in the Navy's interests. Given the role colleges and universities play in performing the majority of DOD-funded basic research, it is critical they maintain the requisite infrastructure and equipment. DURIP's calls for proposals have only been able to fund a fraction of what is needed—in FY 2020, DURIP (including Army and Air Force DURIPs) funded 172 projects but left 552 proposals unfunded, including 229 critical infrastructure and equipment projects that were not funded simply due to a lack of appropriated funds, even though they were considered worthy of support. I respectfully request strong support for URI and at least an additional \$20 million for Navy DURIP (PE 0601103N) in FY 2022.

Defense Applied Research: Task Force Ocean (PE 0602435N/Ocean Warfighting Environment Applied Research)

The Chief of Naval Operations launched Navy's Task Force Ocean (TFO) in 2017 to bolster the Navy's commitment to ocean science and technology by strengthening partnerships with academia and the private sector to advance ocean science relevant to Navy interests. Its goals and scope are based on the recognition that the entire U.S. ocean scientific and technological enterprise must be utilized to sustain our naval competitive advantage. I appreciate the subcommittee's support for TFO and respectfully request an increase of \$10 million to the Ocean Warfighting Environment Applied Research, Navy RDT&E, Line 10, PE 0602435N for Research at Sea in Support of Task Force Ocean. This additional funding would enable more at-sea research that would help the Navy improve operations and meet its goals. It would allow for increased testing and demonstration of science and technology concepts (e.g., seagoing oceanography, acoustics, signal processing, uncrewed systems, and data analytics) and would more quickly move research to operations due to the increased number of scientists and projects able to go to sea.

Defense Applied Research: National Oceanographic Partnership Program (PE 0602435N/Ocean Warfighting Environment Applied Research)

For more than 20 years, the National Oceanographic Partnership Program (NOPP), established in the National Defense Authorization Act for Fiscal Year 1997, has been facilitating interagency and public-private partnerships and advancing large-scale collaborations in ocean research that address economic development, national security, quality of life, and science education. NOPP-supported projects have enabled unique partnerships between DOD, federal agencies, universities, and the private sector to help us understand our ocean, improving our understanding of strategic bathymetric and natural processes that are essential to advanced ocean combat and security activities, particularly with respect to China's growing interest in ocean domination. NOPP has also helped grow the ocean-STEM pipeline through support of the National Ocean Sciences Bowl (described below) and significantly contributes to the buildout and modernization of the National Security Innovation Base. I greatly appreciate the Navy's continued support for NOPP and respectfully request an addition \$8.7 million above the FY 2021 enacted level for a total of \$17.5 million.

Finally, it is imperative that Navy STEM funding be prioritized and increased, as attracting, recruiting, and retaining a talented and diverse workforce is critical to operations. Building a diverse workforce capable of maintaining our military superiority does not start with support for those already in the STEM fields (which is an important component of it) but instead begins with bringing talented individuals to the pipeline. A series of workshops supporting the development of TFO's strategy and roadmap recommended investing in K–12 ocean-STEM initiatives—because the recruitment pipeline must begin prior to university training or military enlistment—as a mechanism to ensure the Navy has an adequate ocean science workforce in the coming decade.

However, most high schools don't include Earth or ocean sciences as part of their formal coursework; while 98% and 94% of high schools offer disciplinary biology and chemistry courses, respectively, only 48% offer environmental or Earth science courses. Therefore, it is up to informal education programs to build interest and knowledge in ocean science and careers in ocean science and engineering. It is crucially important for the Office of Naval Research (ONR) to increase investment in informal ocean education programs. For example, ONR is a founding sponsor of the National Ocean Sciences Bowl (NOSB), but support for such educational programs—as with ocean science as a whole—has not been able to keep pace with the need for talent in this field. In its 24-year history, the NOSB, a program of COL and a quiz-bowl style ocean science competition for high schoolers, has introduced tens of thousands of students to the possibility of a career in ocean science years before they might have otherwise considered it as a career path (if at all). By supporting

the NOSB, the Navy can engage a future skilled workforce capable of enhancing maritime domain awareness and exploring viable solutions to the growing challenges facing our ocean and planet. I respectfully request an additional \$50 million to support ONR's K-12 STEM education efforts.

Thank you for the opportunity to submit testimony and for your time and consideration, as maintaining our nation's competitive advantage in the maritime domain is of utmost importance.

CONSORTIUM FOR OCEAN LEADERSHIP MEMBERS

Alaska Ocean Observing System	Ocean Aero, Inc.
Alaska SeaLife Center	Old Dominion University
Aquarium of the Pacific	Oregon State University
ARCUS	Pennsylvania State University
ASV Global, LLC	Rutgers University
Bermuda Institute of Ocean Sciences	Saildrone
Bigelow Laboratory for Ocean Sciences	Savannah State University
Chevron USA	Schmidt Ocean Institute
College of William & Mary (VIMS)	Sea-Bird Scientific
Columbia University (LDEO)	Severn Marine Technologies, LLC
Consumer Energy Alliance	Shell
Cooperative Institute for Research in Environmental Sciences	Skidaway Institute of Oceanography of UGA
Dauphin Island Sea Lab	Sonardyne, Inc.
Duke University	South Carolina Sea Grant Consortium
Earth2Ocean	SURA
East Carolina University	Stanford University
Esri	Stony Brook University
Estuary & Ocean Science Center, San Francisco State University	Texas A&M University
Exocetus Autonomous Systems	ThayerMahan
FAU Harbor Branch Oceanographic Institute	U.S. Arctic Research Commission
Florida Institute of Oceanography	U.S. Naval Postgraduate School
Harte Research Institute	University of Alaska Fairbanks
Hubbs-SeaWorld Research Institute	University of California, Davis
IEEE Oceanic Engineering Society	University of California, San Diego (Scripps)
Institute for Global Environmental Strategies	University of California, Santa Barbara
IOOS Association	University of California, Santa Cruz
JASCO Applied Sciences	University of Delaware
L-3 MariPro, Inc.	University of Florida
Liquid Robotics, Inc.	University of Hawaii
Louisiana State University	University of Maine
Louisiana Universities Marine Consortium	University of Maryland Center for Environmental Science
MARACOOS	University of Massachusetts, Dartmouth
Marine Technology Society	University of Miami
Massachusetts Institute of Technology	University of New Hampshire
Monmouth University Urban Coast Institute	University of North Carolina, Chapel Hill
Monterey Bay Aquarium Research Institute	University of North Carolina, Wilmington
Moss Landing Marine Laboratories	University of Rhode Island
Moore Foundation	University of South Carolina
Mystic Aquarium	University of South Florida
National Ocean Industries Association	University of Southern California
NERACOOS	University of Southern Mississippi
New England Aquarium	University of Texas at Austin
North Carolina State University	University of Washington
North Pacific Research Board	University of Wisconsin, Milwaukee
Nova Southeastern University	School of Freshwater Sciences
	Vulcan, Inc.
	Woods Hole Oceanographic Institution

[This statement was submitted by Dr. Alan P Leonardi, President and CEO, Consortium for Ocean Leadership.]

PREPARED STATEMENT OF THE FOREIGN INTELLIGENCE SURVEILLANCE COURT

Dear Chair Tester, Ranking Member Shelby, and Members of the Senate Defense Appropriations Subcommittee:

Thank you for the opportunity to submit testimony concerning the public availability of significant Foreign Intelligence Surveillance Court (FISC) decisions, orders, and opinions. The FISC rules on government requests to conduct domestic electronic surveillance pursuant to the Foreign Intelligence Surveillance Act. Unlike traditional courts, whose opinions and orders are publicly available by default, the FISC's decisions, orders, and opinions (hereinafter "opinions") are routinely kept secret.

A cornerstone of any democracy is the rule of law, which requires that laws be available to the public. This is the method through which the public consents to the law and creates a feedback mechanism through which law is made to reflect popular will. To the extent the FISC issues rulings that interpret and expand upon laws enacted by Congress, those substantive opinions must be publicly available for the democratic process to work.

The role of the FISC has expanded over the decades to include issuing substantive opinions, but laws governing transparency of those opinions have been slow to keep up. For example, there was controversy over mass surveillance in 2013 arising in part from decisions of the FISC, which prompted Congress to debate new transparency and accountability measures intended to ensure the FISC's opinions are sound and reflect Congressional intent.¹ Ultimately, Congress chose to amend the Foreign Intelligence Surveillance Act in 2015 to provide for more transparency.

Specifically, Congress directed the release of significant FISC decisions, orders, and opinions. Section 402 of the USA Freedom Act of 2015 requires the Director of National Intelligence, in consultation with the Attorney General, to "conduct a declassification review of each decision, order, or opinion issued" by the Foreign Intelligence Surveillance Court "that includes a significant construction or interpretation of any provision of law."² Accordingly, the FISC has published some materials online.³

The original scope of section 402 is unclear. Was it to apply to all opinions or only opinions from 2015 forward? Regardless, the Executive branch took the position that the law should not be understood to apply to all rulings, but only those from 2015 forward. Thus, Congress, the public, and litigants before the FISC have some access to recent substantive opinions, but virtually no access to an unknown number of prior, substantive rulings by the Court. These earlier decisions have precedential effect.

We believe, within the framework established in law, that all of the FISC's substantive rulings should be publicly available, regardless of when they were issued.

This view is shared by the House of Representatives and the Senate, which both passed legislation requiring disclosure of substantive FISC opinions last Congress as part of the USA FREEDOM Reauthorization Act of 2020.⁴ A disagreement over an unrelated matter prevented that bill from becoming law.

Section 301 of the draft USA FREEDOM Act, as engrossed by the House of Representatives, provided for a declassification process for all substantive opinions.

"Section 602 of the Foreign Intelligence Surveillance Act of 1978 (50 U.S.C. 1872) shall apply with respect to each decision, order, or opinion issued by the Foreign Intelligence Surveillance Court or the Foreign Intelligence Surveillance Court of Review before, on, or after the date of the enactment of such section. With respect to such decisions, orders, or opinions issued before or on such date, the Director of National Intelligence shall complete the declassification review and public release of each such decision, order, or opinion pursuant to such section by not later than one year after the date of the enactment of this Act." (emphasis added).

The Senate passed identical language. As mentioned above, the House requested a conference committee to address other matters, but the Senate did not concur and the legislation died.

¹ Reform of the Foreign Intelligence Surveillance Courts: A Brief Overview, Congressional Research Service Rpt. R43451 (March 31, 2014). <https://www.everycrsreport.com/reports/R43451.html>.

² USA FREEDOM Act of 2015, P.L. 114–23. <https://www.congress.gov/bill/114th-congress/house-bill/2048>.

³ See Public Filings—U.S. Foreign Intelligence Surveillance Court, United States Foreign Intelligence Surveillance Court (accessed May 12, 2021). <https://www.fisc.uscourts.gov/public-filings>.

⁴ USA FREEDOM Reauthorization Act of 2020, H.R. 6172. <https://www.congress.gov/bill/116th-congress/house-bill/6172/text/eh>.

We note there is ongoing litigation to provide for transparency concerning FISC opinions. A petition to the U.S. Supreme Court, filed by ACLU lawyers, former Solicitor General Ted Olson, the Knight First Amendment Institute at Columbia University, and the Media Freedom and Information Access Clinic at Yale University, “argue[d] that the First Amendment gives the public a presumptive right of access to significant judicial opinions, including those of the FISC.”⁵

This is a matter best resolved by Congress. The FISC is a creation of the Legislative branch and the determination of what should be made publicly available should be made by the people’s representatives. In our view, such direction is best grounded in Congress’s policy-making function, not the Court’s remedial function concerning Constitutional violations.

The Defense Appropriations Act for FY 2022 is the best route to address transparency concerning all significant FISC opinions. In addition, this request is within the scope of work traditionally performed by appropriators. We are requesting the Director of National Intelligence be directed to provide all significant decisions, orders, and opinions to appropriators pursuant to the already existing legal framework, and to make them publicly available as part of that process. Appropriators routinely request reports from agencies on matters of public interest and direct that they be publicly available. Because Defense Appropriations has jurisdiction over the Office of the Director of National Intelligence, we make this request of you.

Please direct the Director of National Intelligence to report to Congress and to make publicly available all current and historical decisions, orders, and opinions as described in Section 402 of the USA Freedom Act of 2015 (50 U.S.C. 1871(a)(5)) within one year of enactment of the Appropriations Act.

Thank you again for the opportunity to submit this testimony.

PREPARED STATEMENT OF THE HALO TRUST

Please Support \$19 Million for the Humanitarian Demining Research and Development Program.

As the world’s largest humanitarian demining organization, The HALO Trust leads the effort to protect lives and restore livelihoods for those affected by conflict. We remove and destroy landmines and other explosive remnants of war and help secure weapons that could fall into the hands of terrorist groups. Since 2002, HALO has partnered with the U.S. Department of Defense’s (DOD) Humanitarian Demining Research and Development (HD R&D) Program in more than ten countries and territories. This program, implemented by the U.S. Army, specializes in developing and testing innovative technologies to detect and clear landmines, unexploded ordnance (UXO), and improvised explosive devices (IEDs). These technologies increase the effectiveness, efficiency, and safety of demining operations for military and humanitarian use—saving lives and taxpayer money.

The HD R&D team designs technologies to respond to technical challenges in the field, drawing from new commercial technology, equipment currently in use by the DOD, and advanced sensor technology available only through other DOD R&D programs. They then trial prototypes in real field conditions through partnerships with the Department of State’s (DOS) humanitarian demining programs. During field evaluations, operators provide feedback on the functionality and effectiveness of the equipment. This allows HD R&D to modify and improve the equipment and increase the U.S. technical capacity to respond to explosive threats.

HD R&D produces four specific outcomes. First, the field evaluation process collects data that helps to improve detection technologies used by the U.S. Armed Forces. Second, successfully trialed equipment is used to train and equip explosive disposal units of the U.S. military and allied militaries. By equipping partner militaries to address their own explosive threats, U.S. soldiers are more likely to remain out of harm’s way. Third, HD R&D equipment saves civilian lives from landmines, most frequently children, and amplifies the impact of American assistance by increasing the amount of clearance performed on DOS projects without increasing costs. Fourth, the HD R&D program supports American jobs by utilizing American manufactured machines and products when possible in their equipment development process.

The HD R&D Program has a track record of success, having performed nearly 240 operational field evaluations in 43 countries since 1995. The program is responsible for developing advanced technology for the Handheld Standoff Mine Detection Sys-

⁵ The Public Should Have Access to the Surveillance Court’s Opinions, by Charlie Hogle and Alex Abdo, Just Security (April 19, 2021). <https://www.justsecurity.org/75809/the-public-should-have-access-to-the-surveillance-courts-opinions/>.

tem, which combines metal detection with ground penetrating radar, the rotary mine comb, designed to efficiently excavate low metal content anti-vehicle mines, and TRAXX, built to cut through hard-to-see tripwires and lift mines from soil. Overall, HD R&D equipment has been used to clear more than 19,000 acres of land, and to destroy more than 226,000 mines and UXO.

As you know, HD R&D now receives funding from the following account: *Research, Development, Test & Evaluation, Army/Advanced Component Development & Prototypes/PE: 0603920A/Program Title: Humanitarian Demining*. Due to strong bipartisan support, the program received \$17 million in Fiscal Year 2021. However, the FY22 President's Budget proposes only \$8.649 million for HD R&D, which would represent a 49% decrease from the previous year, and the lowest funding level in over ten years. This proposed funding reduction would substantially curtail the ability of the HD R&D program to develop necessary demining equipment that would otherwise create cost savings on State Department demining contracts and protect our soldiers.

This program has a long list of unfunded projects it is waiting to trial, including anti-tank mine detection equipment in Afghanistan and magnetic technology in Iraq. Further, this program recently moved under Army Futures Command and will now be subject to an Army tax that will cut into its program budget, unless this new expense is offset through a higher appropriation this year. Thus, even flat funding the program at a level of \$17 million would result in reduced resources for technological advances required by military and humanitarian deminers.

We appreciate the support this subcommittee has provided for this valuable program, and urge the subcommittee to raise funding to a level of \$19 million in FY22 for HD R&D. This additional funding will improve the ability of U.S. soldiers and our allies' ability to safely detect and clear landmines, UXO, and IEDs. This funding is especially important as new conflicts uncover new threats in areas like the Middle East, Libya, and Ukraine.

Thank you for your consideration of this request.

[This statement was submitted by Chris Whatley, Executive Director, The HALO Trust (USA).]

PREPARED STATEMENT OF THE MELANOMA ACTION COALITION

Dear Chairman Tester and Ranking Member Shelby:

The Melanoma Action Coalition thanks you for supporting the Defense-funded melanoma research in the Fiscal Year 2021 Defense Appropriations bill and requests that the Senate Defense Appropriations Subcommittee provide \$40 million for melanoma research in the Fiscal 2022 Department of Defense Appropriations bill. This program is funded within the Defense Health account.

The Melanoma Action Coalition represents more than 40 community-based foundations and advocates nationwide focused on increasing awareness about melanoma, providing education about sun safety, and raising funds for melanoma research. Each of us has been touched personally by melanoma. Some of us are survivors; others have lost spouses or children to this disease. We are united by our dedication to working towards a time when no other individuals or families suffer the pain and loss that we have experienced.

Melanoma is a unique and major threat to our military community, who carry out their missions in environments of extreme solar radiation. Decades of studies from WWII to the current generation of war fighters confirm the linkage of this exposure to the development of deadly melanoma. Continued innovation in melanoma prevention, detection, and treatment is only possible with continued investment in high quality research.

A 2000 "Annals of Epidemiology" study comparing mortality among WWII veterans of the Pacific and European Theaters found that Pacific Theater Prisoner of War veterans had an estimated 3 times greater risk of dying from melanoma than veterans of the European Theater.¹ The article concluded that these data are "consistent with the hypothesis that exposure to high levels of solar radiation in young adulthood is associated with a higher risk of melanoma mortality."²

According to The Pulse, the online source for the Uniformed Services University, "melanoma is the most significant cancer to affect the active duty military popu-

¹Page, William F., David Whiteman, and Michael Murphy. "A comparison of melanoma mortality among WWII veterans of the Pacific and European theaters." *Annals of epidemiology* 10, no. 3 (2000): 192-195.

²Ibid.

lation.”³ A Vanderbilt School of Medicine study cites that only 22 percent of military personnel were made aware of the risks of sun exposure, 77 percent reported being exposed to bright sunlight for more than 4 hours a day, and only 27 percent had regular access to sunscreen.⁴ The study concluded that “the past decade of United States’ combat missions, including operations in Iraq and Afghanistan, have occurred at a more equatorial latitude than the mean center of the United States population, increasing the potential for ultraviolet irradiance and the development of skin cancer.”⁵

Recent studies have borne out these conclusions. A study published in the Military Service Monthly Report found that in a 10-year surveillance period from 2005 to 2014, malignant melanoma was one of the most frequent cancer diagnoses among male service members, and the second most frequent cancer diagnosis among female service members.⁶ Another 2014 Military Medicine Study found that the overall incidence rate of melanoma in active duty military personnel between 2000 and 2007 was 62 percent greater than among the general population during the same period.⁷

Given the clear threat melanoma poses to our service members, and the volume of high-quality research proposals, the Melanoma Action Coalition respectfully requests that the committee provide \$40 million for melanoma research in the Fiscal Year 2022 Defense Appropriations bill.

Thank you for considering this important request. Should you have any questions, please contact me at: contact@melanomaactioncoalition.org.

Sincerely,

[This statement was submitted by Neil Spiegler, President, Melanoma Action Coalition.]

PREPARED STATEMENT OF THE NATIONAL MULTIPLE SCLEROSIS SOCIETY

Mr. Chairman and Members of the Subcommittee, thank you for this opportunity to provide testimony on behalf of the National Multiple Sclerosis Society (Society) regarding Department of Defense (DoD) Appropriations for fiscal year 202 (FY22). We are pleased to be able to discuss the importance of the research funded by the Multiple Sclerosis Research Program (MSRP) to those affected by MS.

Thank you for the investment that you have provided for the MSRP. Past Committee investments have allowed the program to fund a new clinical trial award mechanism and expand its focus to identify triggers and risk factors for MS. As you consider funding priorities for FY22, we urge the Subcommittee to provide \$20 million for the MS Research Program (MSRP) within the Congressionally Directed Medical Research Programs (CDMRP). This is the same funding level that Congress awarded the program last year and we believe that this funding level will ensure the greatest return on investment in the program and maintain funding consistency for MS researchers.

Multiple Sclerosis (MS) is an unpredictable, often disabling disease of the central nervous system that interrupts the flow of information within the brain, and between the brain and body. Symptoms range from numbness and tingling to blindness and paralysis. The progress, severity, and specific symptoms of MS in any one person cannot yet be predicted. Nearly one million Americans live with MS and most people with MS are diagnosed between the ages of 20 and 50, with women being diagnosed at two to three times higher more often than men.

The Society mission is to cure MS while empowering people affected by MS to live their best lives. To accomplish this, the Society funds cutting-edge research, drives change through advocacy, facilitates professional education, collaborates with MS organizations around the world, and provides programs and services designed to help people with MS and their families live their best lives. We see ourselves as

³Mason, V. (2018). Improving the Detection of Melanoma in Active Duty Military. [online] The Pulse. Available at: <https://usupulse.blogspot.com/2018/02/improving-detection-of-melanoma-in.html> [Accessed 26 Feb. 2020].

⁴Powers JG, Patel NA, Powers EM, Mayer JE, Stricklin GP, Geller AC. Skin cancer risk factors and preventative behaviors among United States military veterans deployed to Iraq and Afghanistan [published online ahead of print June 25, 2015]. *J Invest Dermatol*. doi: 10.1038/jid.2015.238.

⁵Ibid.

⁶Lee, T., V. F. Williams, and L. L. Clark. “Incident diagnoses of cancers in the active component and cancer-related deaths in the active and reserve components, US Armed Forces, 2005–2014.” *MSMR* 23, no. 7 (2016): 23–31.

⁷Lea, C. Suzanne, Jimmy T. Efrid, Amanda E. Toland, Denise R. Lewis, and Christopher J. Phillips. “Melanoma incidence rates in active duty military personnel compared with a population-based registry in the United States, 2000–2007.” (2014): 247–253.

a fundamental partner to the U.S. government in many critical areas—particularly in the arena of MS research. To date, the Society has invested over \$1 billion dollars in research, and we work in coordination and collaboration with our federal partners at the National Institutes of Health (NIH) and the MSRP to ensure that the best research is funded and that there is no overlap or duplication.

The CDMRP is a peer-reviewed program funded through the Department of Defense via the Defense Appropriations Act. Individual programs like the MSRP are funded at the direction of Congress and fill research gaps by funding high impact, high-risk and high gain projects that other research agencies—like the NIH, may not venture to fund. The CDMRPs are distinctive in that they involve active participation of people living with the program disease area. These patients and patient representatives are highly coveted roles, as they are involved in all areas of the program—from establishing the mission/vision of the program, to reviewing applications and making recommendations for funding, and evaluating the impact of the program. People living with MS value the opportunities within the MSRP as a way they can engage in the research process. The Society applauds the way MSRP structure is designed and believes that it aligns with the direction of patient centered drug development and care in the research and drug development ecosystem.

MS Prevalence and Military Service

The Society confirmed that nearly one million people are living with MS in the United States, more than twice the original estimate from previous studies.¹ Extrapolating figures this estimate, we believe there are approximately 70,000 veterans in the U.S. that live with MS. Each year, the Veterans Health Administration provides care to more than 20,000 veterans living with MS. Additionally, between the years 2009–2018, over 2,400 active-duty service members, reserve, and National Guard members received a new diagnosis of MS within the military health system (MHS).² Including other DOD beneficiaries such as former Service members and family members, the MHS had more than 21,000 new cases of MS. During this period, more than 36,000 DOD beneficiaries had over 1.1 million outpatient encounters and 537,000 hospital bed days for MS within the MHS.³ In addition, the Department of Veterans Affairs Multiple Sclerosis Centers of Excellence, East and West branches, serve approximately 49,000 Veterans with MS.⁴

MS is considered a presumptive condition and veterans who have symptoms of MS in the military or within seven years after honorable discharge are eligible for the service-connected status. To date, approximately 12,000 U.S. veterans have a service-connected disability for MS, meaning that their MS was incurred or aggravated during their military service. An advisory committee by the Veterans Administration recommended further study into the potential link between combat service and increased risk of developing MS. The Society supports this recommendation and believes that more research is needed that examines the longer time impact for those who have served, from veterans from the Vietnam War through to those who served in Operation Enduring Freedom, Iraqi Freedom and New Dawn. To appropriately monitor this cohort of servicemen and women, the Society recommends that Congress ensure that information and data can be easily shared between the U.S. Department of Veterans Affairs and the Department of Defense. Because the demographics of the military have changed over the past several decades, it is more critical these two Agencies can share data in real time to examine health impacts and needs by age, race, ethnicity and sex/gender.

Research into the underlying causes of MS and improving methods of diagnosing, treating and potentially curing MS is critical to improving the lives of those serving in the military and all of those living with MS. As the underlying cause of MS is still unknown, MSRP funded research will help improve knowledge about those currently serving in the military who can be deployed to areas and environments that may increase the risk of developing neurologic diseases like MS. Further, MRSP

¹Mitchell T. Wallin, William J. Culpepper, Jonathan D. Campbell, Lorene M. Nelson, Annette Langer-Gould, Ruth Ann Marrie, Gary R. Cutter, Wendy E. Kaye, Laurie Wagner, Helen Tremlett, Stephen L. Buka, Piyameth Dilokthornsakul, Barbara Topol, Lie H. Chen, Nicholas G. LaRocca. *Neurology* Mar 2019; 92 (10) e1029-e1040; DOI: 10.1212/WNL.0000000000007035.

²Williams VF, Stahlman S, Ying S. 2017. Multiple sclerosis among service members of the active and reserve components of the U.S. Armed Forces and among other beneficiaries of the Military Health System, 2007–2016. *MSMR* Aug; 24(8): 2–11.

³Data includes both direct care (care received at Military Treatment Facilities) and purchased care (care received at Civilian facilities that is covered by TRICARE). Data does not include care received while deployed, or any care received outside of the Military Health System that was not processed through TRICARE.

⁴Gromisch ES, et al. Who is not coming to clinic? A predictive model of excessive missed appointments in persons with multiple sclerosis. *Mult Scler Relat Disord.* 2020 Feb;38:101513.

supported projects will also improve understanding on how to counter these environmental triggers to improve the readiness and deployability for future service personnel.

Multiple Sclerosis Research Program

The MRSP was established by Congress in 2009. Its vision is to prevent, cure, reverse, or slow the progression, and lessen the personal and societal impact of MS. Like many of the other programs within the CDMRP, the MSRP specifically encourages applications that address critical needs of the MS community and concentrate on: the biological basis of disease progression, risk factors leading to the prevention of MS, drug discovery and biomarkers for preclinical detection of MS. MSRP research has led to four patent applications and patents. To date, Congress has appropriated approximately \$73.1 million dollars to the MSRP, including \$16 million for FY20. The total MSRP investment since 2009 has funded 111 awards, 98 projects, 4 clinical trials and 3 patents. MSRP funded investigators have been awarded 47 follow-up research grants from federal and non-federal research partners, including the NIH and the Society, totaling over \$34 million to build on and advance knowledge gained from the initial MSRP funded grant.

MSRP funds studies that examine gap in MS from basic science to rehabilitation research. A particular area of interest in MS research is imaging technology, as diagnosis of MS and tracking disease progression remains challenging, both for active-duty military personnel, veterans and civilians. Magnetic resonance imaging (MRI) is often used by health care providers to track disease activity. Currently, MRI findings are not accepted by the Food and Drug Administration as indicators of clinical meaningfulness in the MS drug development and approval process and more research is needed in the form of more long-term studies correlating brain MRI with disability progression.

Additionally, a growing body of evidence have implicated environmental, genetic factors, age, and microbial infections in the development of MS. Recent MRSP funded studies have examined alternations in the gut microbiota and suggest that these alterations influence the onset and progression of autoimmune diseases like MS. This information will be incredibly useful to people with MS, who often ask about the impact of dietary and lifestyle changes to help manage MS symptoms and reduce the occurrence of relapses.

This body of research that will improve MS diagnosis and the drug development process, by answering questions that are important to people living with MS. Further, MSRP funded research allows the healthcare system to better track disease progression and activity, allowing healthcare providers in both the military and civilian populations to better anticipate the needs of people living with MS. The clinical application of the research done at MSRP is particularly important—as MRSP also funds novel research to expedite much needed symptom management treatments for those living with MS. Further, the clinical application of this research will facilitate better conversations surrounding troop readiness and the ability of an individual to deploy.

Due to the impact the MSRP has had on driving both novel research into MS and its focus on funding innovative research focused on the development of potential therapies to improve diagnosis and treatment of MS, the Society requests that Congress continue to fund the MSRP at \$20 million in FY22.

On behalf of the Society, thank you to this Committee for its investment in the CDMRP, particularly the MSRP. We appreciate the opportunity to provide written testimony and our recommendations for FY22 appropriations for the program. The MSRP is of vital importance to people living with MS and we look forward to continuing to work with the Committee to help move us closer to a world free of MS.

[This statement was submitted by Leslie Ritter, Associate Vice President, Federal Government Relations, National Multiple Sclerosis Society.]

PREPARED STATEMENT OF THE NEUROFIBROMATOSIS NETWORK

Thank you for the opportunity to submit testimony to the Subcommittee on the importance of continued funding for the Department of Defense's Peer-reviewed Neurofibromatosis (NF) Research Program (NFRP). NF is a terrible genetic disorder closely linked to many common diseases widespread among the American population. The highly successful Neurofibromatosis Research Program has shown tangible results and direct military application with broad implications for the general population.

On behalf of the Neurofibromatosis (NF) Network, a national organization of NF advocacy groups, I speak on behalf of the 120,000 Americans who suffer from NF

as well as the millions of Americans who suffer from diseases and conditions linked to NF such as cancer, brain tumors, heart disease, memory loss, bone abnormalities, deafness, blindness, and psychosocial disabilities, such as autism and learning disabilities. Thanks in large part to this Subcommittee's strong support, scientists have made enormous progress since the discovery of the NF1 gene in 1990 resulting in clinical trials now being undertaken by the NFRP.

In Fiscal Year 2022, we are requesting at least \$25 million to continue the Army's highly successful Neurofibromatosis Research Program (NFRP). The NFRP is now conducting clinical trials at nation-wide clinical trials centers created by NFRP funding. These clinical trials involve drugs that have already succeeded in eliminating tumors in humans and rescuing learning deficits in mice. In addition, in March 2020, the Food and Drug Administration approved the first ever drug, co-developed by NIH and AstraZeneca, with seed money from the NFRP, for the treatment of plexiform tumors in neurofibromatosis type 1 (NF1). Administrators of the Army program have stated that the number of high-quality scientific applications justify a much larger program. For these reasons, it is imperative that we continue to invest in research if we are to advance toward treatments and a cure for the numerous diseases associated with NF.

WHAT IS NEUROFIBROMATOSIS?

NF is an unpredictable genetic disorder of the nervous system that affects almost every organ system in the body. There are three types of NF: NF1, which is more common, NF2, which initially involves tumors causing deafness and balance problems, and Schwannomatosis, the hallmark of which is severe pain. NF causes tumors to grow along nerves including in the skin, just below the skin, and in the brain and spinal cord. NF is the most common neurological disorder caused by a single gene and affects more people than Cystic Fibrosis, hereditary Muscular Dystrophy, Huntington's disease and Tay Sachs combined. It strikes worldwide, without regard to gender, race or ethnicity. Approximately 50 percent of new NF cases result from a spontaneous mutation in an individual's genes and 50 percent are inherited.

NF can cause a myriad of devastating clinical problems including nerve and brain tumors; disfiguring skin growths; inability to heal after bone fracture, which may ultimately require amputation; psychosocial disabilities, including autism and learning disabilities; unmanageable chronic pain; deafness; blindness; cardiovascular defects; vascular disease; and paralysis. NF gene mutations are also important 'drivers' of cancers in the lungs, liver, brain and breast.

NF'S CONNECTION TO THE MILITARY

Neurofibromatosis (NF) has become a clinical 'model' for advancing medical research. The genetic information learned from NF holds the key to understanding a number of health issues that benefit the war fighter, as well as the general population, including cancer, bone fracture and repair, vascular disease, nerve regeneration, behavior and psychosocial issues, and pain.

The Neurofibromatosis Research Program (NFRP) is providing critical research that directly benefits the War Fighter including:

Bone Repair.—At least a quarter of children with NF1 have abnormal bone growth in any part of the skeleton. In the legs, the long bones are weak, prone to fracture and unable to heal properly; this can require amputation at a young age. Adults with NF1 can have low bone mineral density, placing them at risk of skeletal weakness and injury. The NFRP is a strong supporter of NF1 bone defects research and as a result this field has made significant progress in the past few years. Bone fractures sustained by the war fighter and how to repair them is of interest to the military. Research studies will identify new information about understanding bone biology and repair and will pave the way to new strategies to enhancing bone health and facilitating repair.

Pain.—Severe and unmanageable pain is seen in all forms of NF, particularly in schwannomatosis, and significantly impacts quality of life. NF research has shown similarities between NF pain and phantom limb pain. NFRP funding has been critical in supporting this. Chronic pain, and how to treat it effectively, is one of the most poorly understood areas of medicine but has very high relevance to those in the military recovering from service-related injuries. NF Research in this area could help identify new ways to target pain effectively with the right drugs or therapies.

Vascular Disease.—NF1 elevates the risk of vascular disease including aneurysm, stroke and vessel occlusive disease. NF1 predisposes patients to early cardiovascular disease, which is also the leading cause of death among United States Veterans. NF research has demonstrated that when treating affected NF mouse models with an antioxidant medication it reduced vessel disease. Discoveries related to cardio-

vascular disease in NF1 are likely to be more broadly informative, including for veterans and active duty military personnel.

Psychosocial and Cognitive Disabilities.—In the last couple of years, NFRP research has revealed common threads between NF1 learning disabilities, autism and other related disabilities. Research being done within the NF Clinical Trials Consortium, NFRP created clinical centers, has led to important findings and expanded research in this area. This research contributes to our broadening understanding of how brain signaling can impact on behavior and psychosocial difficulties. Members of the military returning from service can suffer from psychological trauma and it is not easy to understand how this can be effectively treated. As we learn more from the NF population about psychosocial function, we will be able to shed light on this area for the benefit of the military.

Nerve Tumors and Repair.—Nerves are the most common location for tumor development among patients with NF1, NF2, and schwannomatosis. Tumor growth alone, or treatments for the same, commonly cause nerve injury and associated deficits. Identifying mechanisms to improve nerve repair would benefit patients with NF, as well as advance the science needed to better treat nerve injury common in warfighters.

THE ARMY'S CONTRIBUTION TO NF RESEARCH

While other federal agencies support medical research, the Department of Defense (DOD) fills a special role by providing peer-reviewed funding for innovative and rewarding medical research through the Congressionally Directed Medical Research Program (CDMRP). CDMRP research grants are awarded to researchers in every state in the country through a competitive two-tier review process. These well-executed and efficient programs, including the NFRP, demonstrate the government's responsible stewardship of taxpayer dollars.

Recognizing NF's importance to both the military and to the general population, Congress has given the Army's NF Research Program strong bipartisan support. From FY1996 through FY2021 funding for the NFRP has amounted to \$382.85 million, in addition to the original \$8 million appropriated in FY1992. In addition, between FY1996 and FY2019, 430 awards have been granted to researchers across the country.

The Army program funds innovative, groundbreaking research which would not otherwise have been pursued, and has produced major advances in NF research, including conducting clinical trials in a nation-wide clinical trials infrastructure created by NFRP funding, development of advanced animal models, and preclinical therapeutic experimentation. Because of the enormous advances that have been made as a result of the Army's NF Research Program, research in NF has truly become one of the great success stories in the current revolution in molecular genetics. In addition, the program has brought new researchers into the field of NF. However, despite this progress, Army officials administering the program have indicated that they could easily fund more applications if funding were available because of the high quality of the research applications received.

In order to ensure maximum efficiency, the Army collaborates closely with other federal agencies that are involved in NF research, such as the National Institutes of Health (NIH). Senior program staff from the National Institute of Neurological Disorders and Stroke (NINDS), for example, sit on the Army's NF Research Program Integration Panel which sets the long-term vision and funding strategies for the program. This assures the highest scientific standard for research funding, efficiency and coordination while avoiding duplication or overlapping of research efforts.

Thanks in large part to this Subcommittee's support, scientists have made enormous progress since the discovery of the NF1 gene. Major advances in just the past few years have ushered in an exciting era of clinical and translational research in NF with broad implications for the general population. These recent advances have included:

- In March 2020 the Food and Drug Administration approved the first ever drug, co-developed by NIH and AstraZeneca, with seed money from the NFRP, for the treatment of plexiform tumors in neurofibromatosis type 1 (NF1).
- Phase II and Phase III clinical trials involving new drug therapies for both cancer, hearing tumors, vision tumors, bone graft and cognitive disorders.
- Establishment of the Neurofibromatosis Clinical Trial Consortium which includes an operation center and 25 clinical sites. Allows for partnerships with well-established NF Centers, pooling expertise and resources, quicker turn arounds of scientific reviews and regulatory approvals, leveraged work with pharmaceutical companies all towards the common goal of new treatments and a cure for Neurofibromatosis.

- Successful elimination of tumors in NF1 and NF2 mice with the same drug.
- Development of advanced mouse models showing human symptoms.
- Rescue of learning deficits in mice with an already existing well known drug.
- Determination of the biochemical, molecular function of the NF genes and gene products.
- Connection of NF to numerous diseases because of NF's impact on many body functions.

FISCAL YEAR 2022 REQUEST

The Army's highly successful NF Research Program has shown tangible results and direct military application with broad implications for the general population. The program has now advanced to the translational and clinical research stages, which are the most promising, yet the most expensive direction that NF research has taken. Therefore, continued funding is needed to continue to build on the successes of this program, and to fund this promising research thereby continuing the enormous return on the taxpayers' investment.

We respectfully request that you include at least \$25 million in the Fiscal Year 2022 Department of Defense Appropriations bill for the Peer-reviewed Neurofibromatosis Research Program. With this subcommittee's continued support, we will prevail. Thank you for your support.

[This statement was submitted by Kim Bischoff, Executive Director, Neurofibromatosis Network.]

PREPARED STATEMENT OF THE OVARIAN CANCER RESEARCH ALLIANCE AND THE SOCIETY OF GYNECOLOGIC ONCOLOGY

The Ovarian Cancer Research Alliance (OCRA) and the Society of Gynecologic Oncology (SGO) thank the Subcommittee for the opportunity to submit comments for the record regarding our funding recommendations for the Department of Defense Ovarian Cancer Research Program, which is under the Department of Defense Congressionally Directed Medical Research Program. We respectfully request a funding level of \$45 million for the Department of Defense Ovarian Cancer Research Program in Fiscal Year 2022.

The Ovarian Cancer Research Alliance (OCRA) works every day to fund cures, foster community, further conversations and, ultimately, the cause. OCRA is the oldest and largest global organization dedicated to fighting ovarian cancer. We advance research to prevent, treat and defeat ovarian cancer. We support women and their families before, during and beyond diagnosis. And we work with all levels of government to ensure that eradicating ovarian cancer is a priority.

The Society of Gynecologic Oncology (SGO) is a national medical specialty organization of physicians who are trained in the comprehensive management of women with malignancies of the reproductive tract. The SGO's mission is to prevent and treat gynecologic cancers with equity, thereby improving lives through advocacy, engagement, education, research, and collaboration. The SGO's strategic goals include advancing the prevention, early diagnosis, and treatment of gynecologic cancers by establishing and promoting standards of excellence.

OVARIAN CANCER'S DEADLY STATISTICS

Ovarian cancer is the fifth leading cause of cancer-related death in women and the deadliest gynecologic cancer. The American Cancer Society estimates that in 2021, approximately 21,410 women in the U.S. will receive a new diagnosis of ovarian cancer and approximately 13,770 women will die from the disease. Nearly 25 percent of women diagnosed with ovarian cancer will die within a year, and less than 50 percent will survive five years. There is currently no early detection test for ovarian cancer so more than 85 percent of women are diagnosed at late stage when survival is significantly decreased. When women experience a disease recurrence there are limited treatment options with life altering side effects and sub-optimal efficacy.

OVARIAN CANCER'S IMPACT ON THE MILITARY

Of the 850,000 female service members, wives of active duty military and adult daughters of active duty military, approximately 11,800 will be diagnosed with ovarian cancer over the course of their lifetimes. Over the last five years alone, nearly 2,600 members of our military or their families have been hospitalized for ovarian cancer or suspected ovarian cancer. It is clear that the cost of ovarian cancer to our military is great, not only in terms of troop readiness, but also in terms of cancer

care costs: treating all of these cases of ovarian cancer over these patients' lifetimes could cost TRICARE an estimated \$971.2 million. Therefore, it is imperative that the Department of Defense pursues the scientific discoveries that help readiness and address both the personal and economic costs of ovarian cancer.

DOD OCRP: A PROGRAM THAT COMPLEMENTS NON-DEFENSE OVARIAN CANCER RESEARCH

The Department of Defense Ovarian Cancer Research Program (DoD OCRP) was initiated in Fiscal Year 1997 to support high-impact, cutting-edge research that fills unmet needs. The DoD OCRP establishes priorities to target the most critical needs along the research development pipeline from basic to translational to clinical research, including clinical trials, and to push the field of ovarian cancer forward through its vision to "eliminate ovarian cancer".

The DoD OCRP complements but does not duplicate the important ovarian cancer research carried out by the National Cancer Institute (NCI). First, the DoD OCRP funds innovative, high risk, high reward research which many large, non-DoD Federal research agencies do not have the flexibility to engage in. For ovarian cancer research, we believe that the DoD OCRP is the sole funding source for innovative, groundbreaking research with an emphasis on promoting readiness for military members and their families as well as the overall health of citizens of the United States and the world.

Second, the DoD OCRP is designed to prevent funding research that overlaps with other ovarian cancer research that has been funded by the NCI, other agencies, or private foundations. Before funding an award, DoD OCRP grant managers at the DoD are required to thoroughly check all sources of information to determine if a proposal is redundant of a previous DoD OCRP grant or a grant awarded by another federal agency such as the NCI or by a private foundation.

Third, the DoD OCRP pushes investigators to make rapid progress in their research by requiring them to reapply every funding cycle. Because proposal reviews conducted by the DoD OCRP are double blinded by investigator and research institution, an investigator's progress is evaluated on its own merit and must have sufficient new findings, data, or ideas to warrant new funding.

Cancer research performed by the DoD has been responsible for fundamentally changing the way cancer research is conducted. Many innovative practices and methods created by the Congressionally Directed Medical Research Programs have been adopted by the other research agencies, such as the use of cancer patients as consumer reviewers in the proposal review process.

Also, the Congressionally Directed Medical Research Program has created funding mechanisms to incentivize research, such as the Idea Award, that fills voids in our understanding of cancer. Additionally, large ovarian cancer research teams do not exist in many academic medical or research centers. In order to provide much needed mentoring, networking and a peer group for young ovarian cancer researchers, the DoD OCRP created an Ovarian Cancer Academy award in Fiscal Year 2009. The DoD OCRP Ovarian Cancer Academy is growing and meeting its potential of developing a unique, interactive virtual academy that provides intensive mentoring, national networking, and a peer group for junior faculty. The overarching goal of this award is to develop young scientists into the next generation of successful and highly productive ovarian cancer

researchers within a collaborative and interactive research training environment including collaboration with research conducted at military healthcare institutions.

DISCOVERIES AND ADVANCEMENTS IN OVARIAN CANCER

From Fiscal Year 1997–Fiscal Year 2020, the DoD OCRP has received \$371.5 million in Congressional appropriations. Through Fiscal Year 2019, the DoD OCRP has funded 479 research awards, resulting in over 1,583 peer-reviewed publications and 103 patent applications. The DoD OCRP has funded key studies that have led to several new discoveries and advancements in the treatment and understanding of ovarian cancer. These advancements have spanned treatment with FDA approval of rucaparib, an oral therapy for treatment of advanced ovarian cancer, to OVA1, a blood test combined with imaging that can better identify patients at high risk for malignant ovarian cancer. The studies have also served as the basis for the universal ovarian cancer patient genetic testing recommendations.

FUTURE DIRECTION AND STRATEGIC GOALS IN OVARIAN CANCER RESEARCH

The DoD OCRP's Strategic Plan is centered around the scope of the ovarian cancer problem affecting military and veteran populations and all women affected by the disease, as well as the pressing research gaps faced by the ovarian cancer community. The DoD OCRP's ultimate goal is to prevent, detect, treat, and cure ovarian

cancer. The following research goals identified in the DoD OCRP Strategic Plan are critically important to improving patient care and winning the war against this deadly disease:

- Promote readiness for military members and their families as well as the overall health of citizens of the United States and the world.
- Enhance and sustain the pool of ovarian cancer scientists.
- Promote research that will address health disparities and improve access to quality care and the physical and psychosocial well-being of those diagnosed with ovarian cancer.
- Utilize precision medicine and computational approaches that identify individual tumor characteristics and predictive biomarkers across diverse groups to optimize patient care and outcomes.
- Develop or improve the performance of screening and diagnostic approaches.
- Understand the precursor lesion/stem cell, microenvironment, and pathogenesis/progression of all types of ovarian cancer, including rare subtypes.
- Develop and validate models to understand initiation, progression, metastasis, treatment response, and recurrence of ovarian cancer.
- Increase long-term survivorship and improve quality of life throughout the continuum of ovarian cancer care.
- Promote research that focuses on cancer risk and primary prevention.
- Investigate tumor and host response to therapy, including tumor survival, dormancy, cell death, clonal evolution, resistance, and immune factors.
- Promote synergistic team science, including: the OCRP Ovarian Cancer Academy supporting early career ovarian cancer investigators, consortia, and collaboration with intramural and extramural DoD programs.

THE IMPACT OF THE COVID-19 PANDEMIC ON CANCER RESEARCH

The COVID-19 pandemic has had a devastating effect on cancer research in addition to the tremendous public health and economic toll it has extracted. A new study published in January of this year in the *Journal of the American Medical Association (JAMA) Network Open* indicates that during the first wave of the pandemic last spring, the number of newly launched cancer treatment studies dropped by 60%, and that does not include the number of cancer trials that were suspended, delayed, or in which enrollment rates were drastically reduced. According to the JAMA article, the number of ongoing trials fell by approximately 50% last spring.

For these reasons, The Ovarian Cancer Research Alliance and the Society of Gynecologic Oncology are requesting a \$10 million increase for the DoD Peer-Reviewed Ovarian Cancer Research Program, resulting in a total funding request of \$45 million in FY 2022, to preserve current investments in ovarian cancer research and continue the program's successful work to improve prevention, early diagnosis, and survival rates from ovarian cancer.

CONCLUSION

The Ovarian Cancer Research Alliance and the Society of Gynecologic Oncology maintain a long-standing commitment to work with Congress, the Administration, and other policymakers and stakeholders to improve the survival rate from ovarian cancer through education, public policy, research, and communication. Please know that we appreciate and understand that our nation faces many challenges and that Congress has limited resources to allocate; however, we owe it to those who bravely served our country to pursue promising research that will improve treatments for ovarian cancer and improve the survival rate from this deadly disease.

On behalf of the entire ovarian cancer community—patients, family members, clinicians, and researchers—we thank you for your leadership and support for federal programs that seek to reduce and prevent suffering from ovarian cancer. Thank you in advance for your support for \$45 million for the Department of Defense Ovarian Cancer Research Program in FY 2022.

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