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SENATE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON AIRLAND
UNITED STATES SENATE

PRESENTATION TO THE
SENATE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON AIRLAND
UNITED STATES SENATE

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INTRODUCTION

Chair Duckworth, Ranking Member Cotton, and distinguished members of the subcommittee, thank you for having us here today to provide testimony on the United States Air Force modernization efforts. The leadership and support of this subcommittee is critical to our achievement of national security priorities to defend the homeland, deter nuclear and non-nuclear strategic attacks, deter aggression and be prepared to prevail in conflict, and build a resilient joint force.

The Department of the Air Force consists of approximately 700,000 Airmen and Guardians that enable our country to meet the challenges associated with the full range of national security threats. Providing our Airmen and Guardians with the capabilities they need to deter, and if necessary, win is our most sacred obligation. The advancements of China's military modernization efforts and Russian aggression in Eastern Europe highlight the pacing challenges we face and the urgency with which we must act.

The Department of the Air Force's FY23 President's budget request aims to accelerate the development and fielding of a more modern and operationally relevant force that the current strategic environment demands. Our budget request balances the risks of maintaining the current operational requirements of combatant commands with the need to develop and deliver the Air Force needed. The aircraft we seek to retire have served us well and exceeded the requirements they were developed to meet. However, they are not well-suited for today's contested environments or future high-end conflicts. The average age of the Air Force fleet is 29 years with many aircraft flying beyond their intended lifespan and becoming significantly more expensive to sustain.

With congressional support in Fiscal Year 2022, the Air Force was allowed to begin the transition to better face our pacing challenge. While grateful for this support, we continue to face restrictions on the retirement of outdated fighter, tanker, cargo, and command and control aircraft. These restrictions impede investment in the necessary capabilities to deter competitors and win future conflicts. We are conscious of the difficulties associated with these changes and are eager for continued collaboration with Congress, industry, and the communities that support our Air Bases to ensure our Nation's security.

AIR FORCE IN DEMAND

Global Force Management

The Air Force attempts to optimize force capabilities for operations against peer competitors, fulfill Combatant Commander requirements, and provide stability to the Total Force through Joint Staff-led Global Force Management (GFM) processes. We are actively working GFM issues through the Joint Staff as the Department of Defense's (DoD) global command-and-control mechanism to adjust the distribution of forces and conduct global force strategic planning.

As in previous years, during Fiscal Year 2022 (FY22) the Air Force was employed in unique and disparate locations across the globe at all levels of conflict. Our limited supply of capability will never satisfy the global joint force demand for air power. Through GFM, the Air Force worked hard to balance near-term and long-term risks. We have maintained our unique global flexibility to rapidly deploy with scalable, tailorable forces to all Combatant Commanders while ensuring our readiness to face peer competitors in the future.

The Air Force is the nation's "9-1-1" force. The preponderance of our Total Force is required within the opening days of any conflict. We have repeatedly demonstrated our ability to employ air power within hours, at any point on the globe. Looking forward, the Air Force will continue to refine our equities and contributions within GFM processes. We will mature concepts such as Dynamic Force Employment (DFE) and Agile Combat Employment (ACE), and utilize our new force presentation model, Air Force Force Generation (AFFORGEN). Through these initiatives, the Air Force is postured to meet strategic guidance, enhance Total Force readiness, enable modernization, and balance current operations with future requirements.

Dynamic Force Employment

The 2018 National Defense Strategy (NDS) introduced the concept of DFE as a Secretary of Defense resource to provide options for proactive and scalable employment of the Joint Force to compete, deter, and win in great power competition. Since FY19, the Air Force has leveraged DFE as a more effective means of using air power for strategic effect, while recovering and building peer adversary readiness in accordance with the NDS. The 2022 NDS advocates achieving department goals through integrated deterrence, campaigning, and building enduring advantages. Our DFE actions directly support deterrence as well as the synchronized and inter-

related military campaign efforts needed to undermine the coercive actions of competitors or potential adversaries.

Through the application of DFE within GFM processes, the DoD can proactively shape the strategic environment, while modernizing, testing, and gaining readiness to respond to contingencies, and ensure the long-term viability of the Joint Force. Compared to the traditional, readiness-decreasing, heel-to-toe rotational presence, DFE is a better utilization of air power that rapidly meets Combatant Command requirements and assures Allies and Partners. Air power's inherently dynamic, agile, and strategic attributes enhance DFE effects to expand competitive space beyond regularized patterns while providing maximum responsiveness to emergent priority missions. DFE is also a valuable resource for the Air Force to explore, experiment, and refine rapid employment concepts such as ACE and the Bomber Task Force (BTF). These concepts advance air power's global "enhanced maneuver" effectiveness and resiliency. For all these reasons, we continue to receive more requests for DFE than we can satisfy. This demand will continue, and highlights the importance of adhering to national strategy, GFM processes, and the successful fielding of AFFORGEN to maintain a sustainable ready Air Force that can compete and overmatch peer adversaries.

Agile Combat Employment

Changes to the modern operational environment and rapid technological improvements require the Air Force to adjust its scheme of maneuver. Our response to these challenges is to continue to refine the ACE concept. ACE is the ability to quickly disperse and cluster tailorable force packages to a cooperative security location and conduct operations across all domains, while maintaining operational flexibility and increasing resiliency. The operational unpredictability of ACE will present our adversaries with multiple dilemmas and targeting challenges during both day-to-day competition and potential future conflict. ACE requires a revolutionary change in how the Air Force thinks about and conducts operations within the modern environment. To initiate the shift, we recently released our first doctrinal publication on ACE and are studying the many challenges inherent in its implementation. Ultimately, our multi-capable Airmen (MCA), infrastructure and pre-positioning efforts, and Allies and Partners should ensure ACE viability as the concept matures.

Multiple exercises are continuing to validate ACE's ability to project air power and shift combat operations using advanced, agile, and adaptive logistics. For example, in 2021, Airmen

from Lakenheath Air Base, United Kingdom, exercised this concept as part of Exercise BALTIC TRIDENT. This event showcased ACE-enabling concepts such as MCA, interoperability with Allies and Partners, smaller manpower footprints, and reduced reliance on prepared airfields. Earlier in 2022, Airmen from Air Combat Command participated in an ACE exercise out of Seymour Johnson AFB, North Carolina. This exercise tested the 4th Fighter Wing's ability to operate from different locations with varying levels of capacity and support, which ensured Airmen and aircrews were postured to respond across the spectrum of military operations. Continued infrastructure development will help ensure ACE viability. Planned FY22 military construction investments in European and Pacific theaters support this concept's development. Air Force policy guidance in the form of an enterprise-wide tasking order will prioritize activities and investments to support ACE, and is scheduled for release this summer.

Air Force the Nation Needs (Readiness)

Our readiness posture has been flat for almost three years, and indicators suggest it will trend lower in the future as we continue to invest in overdue modernization. This condition represents the confluence of 30 years of compounding issues. Continuous contingency deployments, generally flat budgets with declining real buying power, war bills paid with Operations and Maintenance (O&M) dollars, delayed modernization, and personnel cuts have left the Air Force at a readiness deficit. This deficit cannot be recovered overnight and must continue to be balanced against the priority to modernize the force for the pacing challenge. Building back readiness will take time and requires continued congressional support to make tough choices, including divestment of less relevant systems in order to maximize our resources for the nation's defense. Modernization efforts will yield greater capability, but will also require investment in manpower, the sustainment enterprise, training infrastructure, and a healthy flying hour program. These investments will enable a force that is ready and capable of employing and winning with the advanced capabilities we are acquiring. However, this cannot be realized without stability in GFM levels, which is necessary to properly train and sustain the Air Force. As we transition to the force the nation needs, continued operational demand for Air Force capabilities combined with NDS modernization priorities are driving difficult resource tradeoffs. In order to be ready and relevant for the great power competition ahead, we must transform the force and its training infrastructure to provide the capabilities the NDS demands. We must balance the risk and demands of the current environment with the need to arrive in the future

with the capacity and capability we require. As we transition to the future force, it is essential to modernize and eliminate costly and less-capable legacy systems. These actions will lower operating costs, improve availability, and provide essential capabilities to present a combat-credible and ready force to meet the demands of great power competition.

Operational Training & Test Infrastructure

Experience and experimentation have taught us that combat crews are more lethal and less prone to attrition when they train against the actual or representative threats they will encounter in combat. Therefore, we are fully committed to advancing and modernizing our live and synthetic programs to provide relevant and realistic training for tomorrow's force. Readiness and relevance require training improvements in both the live and synthetic domains. The live domain includes airspace and ranges, and modernizing the replication of current and future adversarial threats. Additionally, it encompasses real-time data processing and control and evaluation of combat training engagements. The synthetic domain requires the creation of a capability that provides all users a complete, relevant, and realistic peer/near-peer synthetic training environment containing an accurate representation of threats, terrain, weather, and friendly forces.

In the live domain, our range priority remains our two largest ranges: the Nevada Test and Training Range (NTTR) and the Joint Pacific-Alaska Range Complex (JPARC). We will upgrade both ranges to replicate a Level 4, peer/near-peer adversary threat environment. With current and programmed funding, NTTR and JPARC are projected to achieve Level 4 by FY30. Additionally, we intend to upgrade six Primary Training Ranges, in both CONUS and OCONUS, to a Level 3 capability by FY33.

Our range modernization approach also addresses the encryption and movement of data to improve the realism of our training events. We will procure the Navy's Tactical Combat Training System II (TCTS-II) to modernize our Combat Training System (CTS) requirement. In addition to addressing the pending obsolescence of our P5 CTS pod, this will provide an ability to share encrypted data for training. Data sharing will allow our 4th and 5th generation, and future platforms to train together in a manner not achievable with current technology. Concurrently, we are pursuing a Live Mission Operational Capability (LMOC) to standardize and modernize our training ranges. This capability allows us to tie legacy threat systems together

to create a more realistic adversary Integrated Air Defense System and eliminates manpower-intensive processes.

Our range modernization approach will ensure our live ranges provide both realistic and relevant training environments to our future force. Live training will always be the cornerstone of Air Force readiness. However, the live training environment is constrained by the geographic limitations and technological improvements of both current and future adversary capabilities. These limitations mandate a shift in portions of our combat training to the synthetic training environment. The synthetic environments will allow aircrew members to fully use their capabilities and effectively practice the tactics, techniques, and procedures they will employ against future adversaries. Shifting advanced training to the synthetic arena requires us to replace disparate, legacy synthetic environments with a training environment that is common across multiple generations of aircraft and associated training systems.

The development of this environment will provide a Level 4 (peer/near-peer) training capability for all operational units while allowing our advanced platforms to exercise capabilities they cannot use in a live environment. The synthetic environment will be the only arena where Air Force, Joint, and Coalition units can train together using their full capabilities in realistic scenarios.

We are confident these tailored improvements to our live and synthetic training capabilities will provide our crews with the ability to maximize the lethality advantage of current and future weapon systems.

Pilot Production

The Air Force remains focused on improving overall pilot inventory. Today, the Air Force is short approximately 1,650 pilots; half of that shortfall is in the Air Reserve Components. In the Regular Air Force, it resides in Company Grade Officer (CGO) ranks due to previous UPT under-production over the past decade. To align pilot requirements with production, we must reliably and sustainably produce 1,500 pilots per year, 1,100 of which must be for the Regular Air Force.

Substantial short-term increases in production to improve the overall inventory sooner are not manageable and can quickly create force management problems with oversized year groups. The production-to-experiencing of pilots is a closed-loop and interdependent system. The Air Force must deliberately plan and pace production increases to approximately 1,500 pilots, and

then maintain it for the foreseeable future. It has taken many years of under-production to create the pilot shortage we currently have, and it will take ten years of producing to the CGO requirement to right-size the force while retaining Field Grade Officers (FGO) to right-shape the force of the future.

The Aircrew Task Force (ACTF) has developed a four-part strategy for recovery. The strategy includes: 1) increasing the production plant capacity to align with requirements; 2) reducing risk within the production plant; 3) maximizing retention to meet FGO requirements and mitigate previous underproduction; and 4) ensuring production and retention efforts deliver a right-sized and shaped pilot force. Additionally, Air Education and Training Command has instituted production initiatives that aim to maximize resources and leverage technology platforms. These include UPT 2.5, Helicopter Training Next, and Alternate Path to Wings. These initiatives modernize pilot training to improve the quality of new pilots for the challenges of 5th generation aviation; streamline the helicopter pilot production path; adjust the training program for those candidates with extensive civil aviation experience or completion of accredited aviation programs; improve simulator instructor recruitment and retention, and evaluate a remote simulator instruction concept. In all of these efforts, we leverage technology to improve the training experience, conduct training earlier, and augment our proven production methods. The quality of our graduates remains critical to our long-term success and readiness. As we deliberately expand production at a methodical pace, the Air Force will not sacrifice quality within our pilot production enterprise.

Air Force Force Generation

The Air Force is transitioning to a new force presentation and force generation model (AFFORGEN) that provides the Service the ability to present a sustainable force offering. AFFORGEN rebuilds high-end readiness for peer competition and major combat operations in accordance with the NDS. Due to air power's inherent flexibility, our previous force presentation and force generation models could not easily define the Service's sustainable capacity and capability limits. Nor could it easily articulate modernization requirements needed for rapid force employment concepts to develop future force readiness. As a result, over the past 20+ years, Air Force force elements were over-consumed responding to the "tyranny of now" at the expense of readiness and modernization for the future. The Air Force lacked the ability to present an easily

understood model that reflected all facets of airpower and that could communicate how the Air Force was being consumed faster than it could rebuild readiness.

To address these issues, and to get after the heart of General Brown's Accelerate Change or Lose initiatives, AFFORGEN has become the Service catalyst for a paradigm and cultural shift in how we prepare and present credible and capable air power. Aligning to a narrative that we can no longer sacrifice future readiness for the sake of responding to constant global demand, AFFORGEN provides the Service with a standardized, easy to understand, and defendable model that builds readiness over time. It clearly predicts the impact of GFM actions to future force offerings, readiness, and modernization.

Institutionalizing AFFORGEN will take leadership at all levels. In close consultation with the Joint Planning and Execution Community, we have begun the hard work today, setting conditions to establish Initial Operational Capability (IOC) in FY23, maturing through FY24 and FY25.

CURRENT CAPACITY AND CAPABILITY

Following National Defense Strategy (NDS) guidance, the Air Force seeks to invest in technologies and field systems that are both lethal and survivable against tomorrow's threats. This ultimately means transitioning away from many legacy platforms in order to free up manpower and resources to modernize and field more capable systems. If we are to modernize to address the emerging threat, we must use resources tied to our legacy platforms and weapons systems that are decreasing in relevance today and will be irrelevant in the future. Retaining systems that have either limited contributions, or are simply not relevant in the future fight, delays modernization and exacerbates future capability gaps. If deterrence fails, our Airmen must have the training, tools, platforms, and operating systems required to win. We must strike a balance between risk in the near-term and risk in the future.

Bomber / Intercontinental Ballistic Missile (ICBM) Force Structure

Our budget request supports the NDS's call for a full-scope modernization of nuclear delivery systems, to ensure a safe, secure, and effective nuclear deterrent to backstop our integrated deterrence approach. Our nuclear deterrent underpins U.S. strategy and diplomacy, as well as every operational plan. It safeguards the homeland, assures allies, and deters adversaries. Sentinel provides an evolutionary capability that enables the U.S. to address growing current and evolving future threats, while simultaneously increasing the safety, security, and reliability of the

U.S. Intercontinental Ballistic Missiles (ICBM) force. Air Force bombers anchor the air leg of the Nation's Nuclear Triad. As a unique national security capability, the B-21 represents the future of this bomber force. As modernization continues, the Air Force it will gradually transition the current three-bomber fleet to a two-bomber fleet of next-generation B-21s and modernized B-52s to provide nuclear and conventional global strike options for decades to come.

B-21

The B-21 Raider will form the backbone of our future bomber force and is the centerpiece of the Secretary of the Air Force's sixth operational imperative. As China and Russia develop new weapons and defenses, it is imperative we maintain the capability to hold at risk any target on the planet. The B-21 underscores our national security as the most flexible leg of the Nuclear Triad and supports Combatant Commanders across the range of military objectives as both a nuclear and conventional bomber. The FY23 President's Budget includes $3.25 billion in Research, Development, Test & Evaluation (RDT&E) funding that continues to fund Engineering and Manufacturing development activities. Additionally, the budget includes $1.79 billion in aircraft procurement to procure the first lot of low rate initial production B-21s, spares, support equipment, and long lead items for the second lot of low rate initial production. There are six B-21 test aircraft in flow on the manufacturing line, which are being built using the same tooling processes and technicians who will build the production aircraft.

In parallel, beddown preparations at Ellsworth Air Force Base (AFB), South Dakota remain on-track. The FY23 President's Budget requests $168 million to support one new military construction project and funds the third increment of the Low Observable Maintenance Facility at Ellsworth AFB. The first B-21s are projected to arrive at Ellsworth AFB in the mid-2020s with base infrastructure ready to support. A second Environmental Impact Statement began in calendar year 2022 to assess the final two basing locations, Dyess AFB, Texas and Whiteman AFB, Missouri.

The Air Force is committed and on track to meet its key performance parameter of building B-21s with an average procurement unit cost of $550 million (Base Year 2010) / $639 million (Base Year 2019), assuming a minimum fleet of 100 aircraft.

B-52

While the last B-52 Stratofortress entered service in the U.S. Air Force in 1962, we expect to continue operating the B-52 through 2050. We will continue to invest in

modernization programs to keep the platform operationally relevant. Major modernization efforts include the Commercial Engine Replacement Program (CERP), the Radar Modernization Program (RMP), integration of the long-range standoff (LRSO) nuclear air-launched cruise missile, and installation of Advanced Extremely High Frequency (AEHF) secured satellite communication capabilities.

The Air Force's number one priority for the B-52 is to ensure platform viability through 2050 and the CERP enables us to achieve this goal. CERP will replace legacy engines (TF33-PW-103) with new military-derivative commercial Rolls Royce F-130 engines. It is important to note that CERP is more complex than just a standard commercial engine refit. CERP includes new engines, flight systems, and cockpit throttles and displays. The RMP is also necessary to ensure viability through 2050 and will modernize the current Strategic Radar (AN/APQ-166), which is based on 1960s technology modified in the 1980s.

Finally, integration of the LRSO and AEHF will bolster the continuation of the B-52's role in the airborne leg of the Nuclear Triad. The Air Force remains committed to B-52 modernization to ensure the nation's oldest and most versatile frontline long range bomber remains relevant through 2050 and beyond.

B-1

The B-1 is a long-range, supersonic multirole bomber capable of flying intercontinental missions with the largest payload of guided and unguided weapons in the Air Force inventory. This budget focuses resources on sustaining and modernizing the remaining combat-coded B-1s greatly facilitated by the retirement of 17 B-1s as authorized in the FY21 National Defense Authorization Act. We will ensure the B-1s remain lethal and viable until B-21s are operational in sufficient numbers. The completed Integrated Battle Station upgrade enhances crew situational awareness and precision engagement capabilities and is the B-1's largest modernization effort ever. The first aircraft with this upgrade was delivered in January 2014 and the last aircraft was completed in September 2020. Additional efforts to update the B-1's communication systems are ongoing and ensure the B-1 remains the backbone of the Air Force's long-range bomber force until the B-21 arrives.

Lastly, the B-1 is the Air Force's threshold platform for the Long Range Anti-Ship Missile (LRASM). Integration of this weapon, coupled with the B-1's long range, high speed,

and large payload capacity, postures the B-1 for an important role in any conflict in the Indo-Pacific region.

B-2

The B-2 is the only long-range strike aircraft capable of penetrating and surviving advanced Integrated Air Defense Systems to deliver weapons against heavily defended targets. Its unique attributes of intercontinental range, precision strike, large conventional or nuclear payloads, ability to penetrate defenses, and low observable profile allow it to execute Nuclear Deterrence Operations, Nuclear Response, Global Strike, and Global Precision Attack missions. The Air Force will ensure the B-2 remains effective until the B-21 is operational. Because delays in the Defensive Management System modernization effort would have limited the operational utility of the system by the time it would have fielded, the Air Force de-scoped the Defensive Management System modernization program. Instead, we are replacing the B-2's unsustainable cathode ray tube displays with modern sustainable displays as part of the B-2 Displays Modernization program.

The Air Force reached Full Operational Capability to re-host the Stores Management Operational Flight Program software in the Flexible Strike program. This enables the B-2 to take advantage of advanced digital weapon interfaces, including those used by the B61-12 nuclear weapon. Other on-going B-2 modernization programs include Adaptive Communication Suite upgrades, enhancement of the Identification Friend or Foe (IFF) system, replacement of the Crash Survivable Memory Unit, integration of hardware upgrades for employment of the B61-12 nuclear weapon, and software upgrades to allow the B-2 to carry the extended range variant of the Joint Air-to-Surface Standoff Missile (JASSM-ER). Finally, the B-2 will continue sustainment efforts for the on-going Low Observable Signature and Supportability Modification effort to improve aircraft maintainability and availability.

Hypersonic Weapon Integration

Hypersonic weapons provide an important capability for Combatant Commanders, and the Air Force is committed to ensuring our long-range strike platforms can employ these systems. In-line with the Air Force's two bomber fleet strategy, we will ensure these weapons are capable of being delivered via our modernized B-52 fleet. In the near-term, the Air Force will utilize the FY22 $10 million congressional add to continue maturing the capability to

externally carry hypersonic weapons utilizing the B-1. The speed, responsiveness, and range of air-launched hypersonic weapons combined with bomber payload capacity provide a necessary and compelling response to meet and surpass the pacing threat of China and Russia.

Intercontinental Ballistic Missile (ICBM) Modernization

ICBMs are integral to U.S. nuclear deterrence. The Air Force is in the initial stages of replacing the 1970s-era Minuteman III capability with the LGM-35A Sentinel Weapon System through the Ground-Based Strategic Deterrent (GBSD) acquisition program. The GBSD is the most cost effective option for modernizing the ICBM leg of the Nuclear Triad and supports the NDS to modernize the capability of nuclear forces. This weapon system will extend and improve the capabilities of the ground-based leg of the Nuclear Triad, providing a credible and responsive deterrent capability against current and emerging adversaries through 2075. The new weapon system will provide improved nuclear surety, safety, and effectiveness with enhanced security features. The new weapon system will provide more efficient operations, maintenance, and security by modernizing critical infrastructure and decreasing lifecycle costs.

The GBSD acquisition program remains on track in pursuing a low risk, technically mature design and is using innovative digital engineering and acquisition strategies to increase development speed and ensure on-time delivery. Deployment is scheduled to begin in the late-2020s in order to resolve capability, attrition, and age-out concerns with the Minuteman-III weapon system, as well as meet warfighter requirements. The nation is focusing investment on these new missiles and the associated infrastructure and accompanying re-entry systems.

Fighter Force Structure

The Air Force must continue to evolve its fighter force to meet the pacing challenge posed by China and the acute threat posed by Russia and ensure the capability and capacity to meet worldwide demands today. Extensive gaming and analysis using the most difficult problem (China) and the most difficult scenario (Taiwan) at the most difficult time (2035), shows that the Air Force must adjust the future fighter force structure mix by changing investment priorities to provide the capability, capacity, and affordability required to defeat any peer threat. The threat will not allow the Air Force to just retain and modernize our current fleets. Modernization programs cannot transform our current 4th generation fighters into 5th generation fighters, or our current 5th generation fighters into Next Generation Air Dominance (NGAD).

In realistic budget projections, we must balance the need for high end technology with affordable capacity. To attain this desired fighter fleet, the Air Force must continue to right size current aircraft inventories to expedite the transition away from less capable, aging aircraft and emphasize investment in future capabilities such NGAD and F-35 modernization. The desired Air Force fighter fleet should match capability and capacity of both platforms and weapons to mission requirements. As part of its force structure change, the Air Force must transition its fighter fleet from seven platforms (i.e., F-35, F-22, F-16, F-15EX, F-15E, F-15C, A-10) to four (i.e., NGAD, F-35, F-15EX, F-16).

On the path to achieving the desired future fighter fleet, the FY23 President's Budget proposes a net change of minus 84 fighter aircraft in FY23, and a total FYDP net change of minus 346 fighter aircraft. These divestitures are critical to building a relevant future force capable of meeting our NDS peer competitor. Resourcing those future capabilities and modernizing our remaining force demands both money and manpower currently tied up in our legacy systems and platforms.

Fighter Force Structure Studies

Our fighters are becoming significantly more expensive to sustain as they age. The average age of the USAF fleet is 29 years which is significantly higher than all other Services. Weapons System Sustainment (WSS) costs have increased approximately 40% above inflation over FY16-27. We need new platforms and weapons to replace an aging force, but also must invest in cutting edge technology needed to confront and pace threats.

Both internally and alongside Office of the Secretary of Defense, the Air Force has performed a TACAIR analysis to evaluate how efficiently different force mixes meet future warfighting challenges in the 2035-2040 timeframe. Specifically, this study focused on fighter force mixes and quantities that were both affordable and militarily effective. The Air Force TACAIR Study was an initial step in creating a long-term plan for our fighter force. While this study was not published, it was used internally by the Air Force to inform both FY23 and future year programming efforts.

Next Generation Air Dominance (NGAD)

The Air Force is investing in technologies as part of a family of capabilities to assure air dominance in the future. NGAD capabilities enable counter-air missions in highly contested operational environments in order to protect and support the Joint Force and replaces the F-22.

The requirement to establish and maintain air superiority within the battlespace cannot be understated as it underpins the joint force operations in any theater. NGAD is our program that supports studies, analyses, technical maturation, and prototyping activities leading to enhancements in lethality, survivability, interoperability, and persistence to ensure air superiority. The Air Force is ensuring affordability and cost control on NGAD through sustained competition for the vehicle and mission systems, adoption of a government-owned open architecture, and digital engineering that stretches into operations and sustainment. The FY23 President's budget requests $1.66 billion in FY23 to fund the continued development of a next generation open mission system architecture, advanced sensors, cutting-edge communications using open standards, and integration of the most promising technologies into the family of capabilities. Furthermore, this program incorporates novel agile acquisition practices through its competitive industry consortium approach that is yielding favorable results and providing greater value for the taxpayer. Our efforts are being shaped by multiple analyses, including recommendations from the Chief of Staff of the Air Force-approved Air Superiority 2030 Flight Plan, recently completed NGAD Analysis of Alternatives, and several others from renowned analytic organizations. Continued investment in NGAD technologies is critical to ensuring continued air dominance within emerging threat environments for all future joint operations.

Collaborative Combat Aircraft (CCA)

CCA are a part of the NGAD family of systems. These un-crewed weapon systems will be designed to work in conjunction with current and next-generation manned aircraft. CCA development draws from and matures autonomous technologies developed in the Air Force Research Laboratory's (AFRL's) Skyborg Vanguard program. The next phase of CCA development will pursue a streamlined concept refinement activity to identify employment concepts, operational requirements, and cost. These concepts are expected to span the design space across expendable, attritable, and exquisite capabilities. The concept refinement phase is ongoing now, leveraging and expanding the diverse range of industry partners developed for the NGAD program, to discover the state of the art.

F-35

The F-35 is the cornerstone of our future fighter fleet. The F-35 today is dominant, purpose built, and equipped with advanced weapons for the contested environment. In the near-term, we must concentrate on achieving the F-35 capability needed for advanced threats. While

the F-35 is a formidable platform today, the Air Force must confront key development, interoperability, sustainability, and affordability challenges to acquire, upgrade, and retrofit the F-35A fleet to obtain the minimum required capability and capacity as quickly as possible within projected resource constraints. To keep pace with the threat in future contested scenarios, follow-on modernization efforts centered on "Block 4" enabled by Technical Refresh 3 (TR-3) hardware must be affordably realized on competition-relevant timelines.

The FY23 President's budget request decreases the F-35 procurement quantity in FY23 to 33 from the FY22 enacted position of 48 aircraft. The Air Force is prioritizing investments in the F-35 fleet, seeking modernization, infrastructure, and advanced weapons in this budget request. Commitments include $4.5 billion to procurement, $1.1 billion, to development and $12.3 billion to fund necessary sustainment. This increased investment ensures maximum future viability of the fleet, albeit with lower procurement numbers.

The Air Force has fielded 340 F-35A aircraft with 29 awaiting engines, power modules, or fan modules. The two largest cost drivers the Air Force controls are the number of aircraft possessed and programmed flying hours, and the major cost categories are parts, people, energy, and consumables. Our F-35A Sustainment Affordability Target for cost-per-tail-per-year (CPTPY) is $4.1 million (BY12$) based on 1,763 F-35As. The current 2020 Joint Service Cost Position is $7.8 million (BY12$) at steady state (2036-2041). The Air Force will continue work with the F-35 Joint Program Office, Navy, and industry to identify and evaluate opportunities to increase depot repair capacity and further reduce the cost of materiel and manpower.

Adaptive Engine Transition Program

The Air Force remains focused on completing planned testing of the prototype adaptive cycle engines and is engaged in the on-going F-35 Joint Program Office Business Case Analysis to inform acquisition planning for upgrading its F-35A aircraft propulsion, power, and thermal management systems. Both Adaptive Engine Transition Program contractors, General Electric Aviation and Pratt and Whitney (a Raytheon Technologies Company), have commenced testing of their respective flight-weight, prototype engines. Test results continue to substantiate significant performance gains in fuel efficiency (up to 25%), thrust (up to 10%), and thermal management capacity, as well as a significant reduction in greenhouse gas emissions (up to 25%) are achievable. The on-going F-35 Joint Program Office Business Case Analysis, along with a companion Air Force operational analysis, will address questions regarding life cycle costs and

affordability of equipping F-35A with an adaptive engine. On-going acquisition planning is using the results from these activities to finalize an acquisition strategy.

F-22

The F-22 is the only operational multi-mission air superiority fighter aircraft that combines stealth, supercruise, maneuverability, and integrated avionics to make it the world's most capable air superiority aircraft. The F-22 Block-20s are now in their third decade and they have the highest operating costs of any Air Force fighter, and they do not possess the combat capabilities resident in the F-22 Block-30/35. Remaining committed to ensuring air superiority for the Joint Force in the highly contested environment against a peer adversary, it is imperative to modernize the F-22 to preserve its advantages while concurrently developing Next Generation Air Dominance. In order to resource both, the Air Force seeks to divest the oldest and least capable F-22s (33 F-22 Block-20s) in FY23. In the near term, three heavily modified F-22 Block-20s will be kept for testing. Additionally, the FY23 President's budget request includes $1.37 billion in FY23 for modernization efforts essential to gain and maintain air superiority against evolving threats. The Rapid Prototyping and Rapid Fielding efforts follow an agile acquisition construct, and combine former TacLink16, Tactical Mandates (TACMAN), Low Drag Tanks & Pylons, Electronic Protection, and GPS M-code programs to deliver slices of each capability on an annual release cadence for capabilities as they mature. Future modernizations will continue to leverage the agile construct as a vehicle to rapidly prototype and iteratively field critical enhancements with capabilities delivered to the fleet in order to ensure "first look, first shot, first kill" capability in highly contested environments. Funds garnered from the divestment of F-22 Block-20s have been reinvested in NGAD development across the FYDP. The transition timeline from F-22 to NGAD is dependent on the progress of NGAD development efforts.

F-15

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 186 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 FY23 President's budget request divests 67 F-15C/Ds from the active fleet. 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 Protection.

The Eagle II additionally brings outsized long range weapons (i.e., air-to-surface and air-to-air) into a peer fight. The FY23 President's budget request procures 24 F-15EX aircraft at a cost of $2.7 billion. Notably, the Air Force remains fully committed to advanced 5th and next generation capabilities and the F-35. The decision to refresh the 4th generation fighter force with the F-15EX is a complementary step to both F-35 procurement and NGAD development, and helps mitigate capacity risk while balancing near-term readiness concerns.

The existing F-15E Strike Eagle fleet provides all-weather, long range global precision attack in all but the highest threat environments. The FY23 President's budget requests $772 million in FY23 to continue modernization efforts to ensure the aircraft remains viable to the 2030s. Modernizing the F-15E with Early Passive Active Warning Survivability System (EPAWSS), also used on the F-15EX, demonstrates our commitment to building a more lethal Air Force. EPAWSS will allow the F-15E/EX to survive to attack targets in high threat environments.

F-16

The F-16 is the Air Force's primary multi-role fighter and Suppression of Enemy Air Defense (SEAD) 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. We are beginning to transition away from our oldest, early block F-16s, with a reduction of 76 planned through FY24. We will continue to modernize the late 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 FY23 President's budget requests $970.7 million in FY23 to continue these modernization efforts. This includes continuing the Service Life Extension Program comprising 12 structural modifications, affecting 450 aircraft, as well as several avionics capability upgrades including the Active Electronically Scanned Array (AESA) Radar upgrade. The new radar replaces the current mechanically scanned radar, with greater ability to detect, track, and identify low-observable, low-flying, and slow-flying targets. This joint emerging operational need of 72 radar systems is complete and fielded. The underway Phase 3 will install an additional 444 radar systems across the Combat Air Force (CAF), Air Force Reserve Command (AFRC), and Air National Guard (ANG), bringing critical capabilities to the F-16 platform to meet aerospace

control alert mission requirements to properly defend the homeland against modern threats. These radars continue fielding in FY23.

A-10

The A-10 remains an effective close air support platform for the current Counter Violent Extremist Organization fight. With very limited utility in a contested fight, we are right-sizing our A-10 fleet for the current and anticipated future demand and then structurally extending and modernizing the aircraft we keep. We have installed 172 new wings on our A-10 fleet and an additional order of 50 wings has been placed and is set to be received from May 2022 through 3QFY25. Once all wing replacements have been installed, the Air Force will have a complete A-10 fleet of 218 aircraft. As we will continue to modernize 218 A-10s, we will reduce the fleet by 21 in FY23. The FY23 President's budget requests $156.4 million (Procurement; and Research, Development, Test, and Evaluation funds) in FY23 for modernization.

Trainers

T-1, T-6, and T-38

The Air Force is continuing investment efforts in its trainer platforms, including critical modernization programs for the T-6 and T-38 fleets. The T-1A fleet is scheduled for divestment between FY23 and FY25. Training of future Mobility pilots, currently being conducted in the T-1A Aircraft, will be accomplished in the T-1A simulators using procedures developed from the Pilot Training Next Innovation Cell at Air Education and Training Command (AETC). The T-6 continues mitigation efforts for the aircraft with the On-Board Oxygen Generation System (OBOGS) to improve the safety of pilot training and address Unexplained Physiological Events (UPEs). To date, mitigation efforts have resulted in an 82% reduction in UPEs. Expected completion of Enhanced OBOGS mitigation efforts is mid-FY24. In FY23, the T-6 will start a major Avionics Replacement Program (ARP) to address Diminishing Manufacturing Sources and Materiel Shortages (DMSMS) for critical avionics issues. For the T-38, modifications are also required to sustain and upgrade the fleet until the T-7A delivers, including avionics, Pacer Classic III, Talon repair, inspections, maintenance, and front canopy replacement programs. The FY23 President's budget requests $6.3 million, $13.8 million, and $121.3 million for the T-1, T-6, and T-38 fleets, respectively.

T-7A

The T-7A Advanced Pilot Trainer replaces AETC's existing fleet of 427 T-38C aircraft with 351 aircraft and associated simulators, ground equipment, spares, and support equipment. The T-7A will provide student pilots with the skills and competencies required to be better prepared to transition into 4th and 5th generation fighter and bomber aircraft. The T-7A program uses a digital engineering approach, which offers significant benefits particularly during the design and build phases. Digital engineering reduces development times, lowers production costs, and allows greater collaboration between the Air Force and Boeing. Modern digital engineering practices are more efficient and yield tangible results by reducing design costs, reducing production support manpower, improving first time quality by 75%, and reducing assembly hours by 80% through task reduction. Additionally, the use of these digital engineering practices and early prototyping enabled the Air Force and Boeing team to identify aerodynamic instability issues at least 22 months earlier in the testing phase than possible using traditional development processes.

The FY23 President's budget request continues the program's Engineering and Manufacturing Development (EMD) and early aircraft flight test efforts, and procures long lead support equipment, ensuring we meet the 2026 Initial Operational Capability and 2034 Full Operational Capability milestones. Rollout of the first EMD T-7A is scheduled to occur April 28, 2022. The Air Force remains committed to working with Boeing to enable the T-7A program to achieve Milestone C in 1QFY24.

Munitions

To meet the priorities outlined in the NDS, the Air Force must maintain a suite of affordable air-to-air and air-to-ground kinetic and non-kinetic weapons delivering capability and capacity to defeat rapidly evolving competitors. As such, we continue to procure preferred munitions, but are tapering production as programs approach warfighter inventory objectives, while simultaneously investing in new technology to counter future peer threats in highly contested environments. The FY23 President's budget request continues to modernize the munitions inventory to enable the future USAF construct. A fiscally constrained environment requires difficult risk-based decisions to offset development and procurement of new weapons. We must accept some near-term risk to build the munitions inventory needed for the future.

The Air Force has shaped its investment based on the correct mix of munitions, aligned with current OSD and Joint Staff planning guidance. This includes balancing stand-off and stand-in munitions. Advanced stand-in weapons bring great capability to penetrating platforms, while stand-off weapons provide adequate range to keep 4th generation aircraft relevant in high-end conflicts. Combined, they provide the volume of fires required to prevail in conflict when necessary.

Weapons that advance USAF capability include advanced air-to-air weapons, the Stand-in Attack Weapon (SiAW), Joint Air-to-Surface Standoff Missile-Extended Range (JASSM-ER), Air-launched Rapid Response Weapon (ARRW), and Hypersonic Attack Cruise Missile (HACM). The USAF will continue to collaborate with the U.S. Navy to share cost and technology. This partnership is critical in countering naval air defense threats.

Joint Direct Attack Munition and Small Diameter Bomb

The Joint Direct Attack Munition (JDAM) inventory levels are approaching objective quantities after several years at high levels of production funding. Current procurement is being held to minimal levels, pending fielding of guidance kit with GPS Military Code (M-Code) receivers and antennas. After increasing tailkit production to 45,000 tailkits per year in FY18 to meet the needs of the Services and Foreign Military Sales (FMS) partners, the Air Force has adjusted to demand and now plans to procure 4,200 tailkits in FY23 with a request of $251.9 million, with U.S. Navy and FMS partners procuring the remaining production capacity.

Small Diameter Bomb I (SDB I) and II (SBD II) provide reduced collateral damage effects and increased load-out per sortie. Due to its high operational utility, the Air Force ramped the line for SDB I from 3,000 weapons per year in FY15 to 8,000 weapons in FY17. With demand dropping and advanced standoff weapons in higher demand, the FY23 President's budget requests $ 46.5 million and plans to order 356 weapons, leaving residual production capacity available to FMS partners. For SDB II, the FY23 President's budget requests $279.0 million to procure 761 weapons.

Joint Air-to-Surface Standoff Missile and Advanced Medium Range Air-to-Air Missile

As the Air Force responds to current operational demands, we are also looking to the future to ensure we are prepared to defend against more advanced threats as directed in the NDS. Doing so requires advanced weapons capabilities and the FY23 President's budget request reflects the Air Force's plan to continue investing in those areas, specifically with the Joint Air-

to-Surface Standoff Missile (JASSM), the Long-Range Anti-Ship Munition (LRASM), and the Advanced Medium Range Air-to-Air Missile (AMRAAM). These weapons provide unique and necessary capabilities for the highly contested environment.

JASSM is the premier air-to-ground, low observable missile for defeating threats in highly contested environments and is the weapon of choice for a future fight against peer adversaries. The program is focused on increasing inventory by implementing a strategy to ramp up production rates and monitor subsystems for obsolescence. To achieve this, we have partnered with industry to expand production capacity to satisfy a 47% increase in our inventory objective. The FY23 President's budget requests $785 million, which uses the full capacity of the second Lockheed Martin production line with 550 missiles.

LRASM, produced in the same facility as JASSM, is a purpose-built anti-ship missile particularly critical for the future fight in a maritime environment. The FY23 President's budget requests $114 million to procure 28 missiles.

The Air Force continues to invest in the next generation medium and long-range air-to-air missiles. AMRAAM is still in production and meets today's requirements, but we will also need to invest to maintain our long history as the world's best Air Superiority Air Force. The Air Force is requesting $320 million for 271 missiles, as industry partners begin to cut-in a solution to obsolescence issues through the Form Fit Function Refresh (F3R) effort.

Stand-In Attack Weapon (SiAW)

To defend the nation in an increasingly competitive global environment, we must look beyond currently fielded weapons systems and invest in future advanced munitions capabilities. To that end, the Air Force continues to invest in development of the Stand-in Attack Weapon (SiAW) to deliver a strike capability to defeat rapidly relocatable targets, a hallmark of the highly contested environment. SiAW is the munition that gives the F-35 unique air-to-surface capabilities in the high end fight for the Joint Force. The FY23 President's budget requests $283 million for SiAW development and prototyping, along with $78 million in procurement funding to field Advanced Anti-Radiation Guided Missile Extended Range (AARGM-ER) on the F-35 as an interim capability.

Hypersonics

The USAF is developing and fielding long-range, hypersonic strike weapons. The Hypersonic Air Launched Cruise Missile (HACM) and the Air-Launched Rapid Response

Weapon (ARRW) will enhance our Global Strike capability in future contested environments. The AGM-183A ARRW requests $114.9 million in FY23 to complete its flight test program. The Air Force has prioritized completion of the ARRW flight test program and will revisit a production decision in the FY24 planning process. The HACM is a planned system for fighter integration and increased load-out for bombers. HACM addresses urgent national defense needs and provides a credible deterrent to adversaries. The FY23 President's budget request of $462 million for HACM development is designed to result in production article procurement by FY27.

Tanker Fleet

Tanker Fleet

The Air Force tanker fleet is a critical capability to all Joint operations. It is crucial that we prioritize modernization over legacy capacity. We are modernizing the tanker fleet through four separate efforts. First, the Air Force is investing $574M across the FY23 Future Years Defense Program (FYDP) to modernize a smaller legacy tanker fleet. Second, we are continuing to deliver new KC-46s with $13.1B invested in new aircraft procurement across the FYDP. Third, the Air Force is initiating the KC-Y program in FY23 with $423M for RDT&E across the FYDP and $1.3B for procurement in FY27 for an initial aircraft delivery in approximately FY29. Finally, the Air Force is continuing divestment of legacy KC-10s and recapitalization of KC-135s that will result in a tanker fleet comprised of 362 KC-135s, 26 KC-10s, and 95 KC-46s by the end of FY23. As of April 2022, we have accepted 57 KC-46 Pegasus aircraft out of a planned total of 179 KC-46s. As we transition away from the aging KC-10 and right-size the KC-135 fleet, we continue to look towards the next generation for tanker recapitalization options.

KC-46

While we continue to sustain the current tanker capability, building the future tanker fleet remains one of the Air Force's top acquisition priorities. The KC-46 will deliver greater operational readiness, flexibility, and survivability to the Global Reach mission. Ninety-four production aircraft are on contract, and the Air Force is in negotiations with Boeing for 15 aircraft in FY22.

The first KC-46 aircraft delivered to Main Operating Base 1, McConnell AFB, Kansas, on 25 January 2019. The Formal Training Unit at Altus AFB, Oklahoma, received its first KC-46 on 8 February 2019. The Air Force established Main Operating Base 2 at Pease Air National

Guard Base, New Hampshire, on 8 August 2019, and Main Operating Base 3 at Seymour Johnson AFB, North Carolina, on 12 June 2020. Main Operating Base 4a at Joint Base McGuire-Dix-Lakehurst, New Jersey received its first two KC-46 aircraft on 9 November 2021. The Air Force will continue taking delivery of KC-46s at a rate of approximately 1.25 per month.

The Air Force remains committed to ensuring Boeing corrects deficiencies identified in both developmental and operational test and evaluation. Partnered with Air Mobility Command, we have worked hard to accept the KC-46 while ensuring its major deficiencies—the Remote Vision System (RVS) and stiff air refueling boom—are properly addressed without undue burden on taxpayers or warfighters.

On 2 April 2020, we reached agreement with Boeing to fix the RVS deficiencies through significant upgrades, known as RVS 2.0, at no additional cost to the government. On 11 April 2022, the Air Force and Boeing officially closed the Remote Vision System (RVS) 2.0 Preliminary Design Review (PDR). The RVS 2.0 design provides marked improvements over the current system. The overall RVS 2.0 program is still on schedule, with design solution and start of fleet retrofit expected in FY24. The air refueling boom engineering change proposal, initially awarded in August 2019, was definitized on 30 September 2020, and the design solution is expected to complete in FY24, with retrofit starting in FY25.

The Director, Operational Test and Evaluation (DOT&E) has stated Initial Operational Test and Evaluation (IOT&E) will conclude after the RVS and boom deficiencies are resolved; IOT&E is expected to complete in FY24. The full-rate production decision is planned after IOT&E is complete and we are in receipt of the statutorily-required Beyond Low Rate Initial Production report from DOT&E.

Despite its current deficiencies, the KC-46 is safe to operate (adhering to flight manual cautions provided to our operators) and will be the Air Force's best tanker for contested environments due to enhanced situational awareness, battle management, and threat countermeasures. By accepting the KC-46 with known deficiencies, the Air Force has enabled familiarization and operational test activities while working with Boeing on long-term efforts to correct deficiencies. Accepting the KC-46, and fixing deficiencies in parallel with operational test and evaluation, is the fastest way to achieve full operational capability to meet warfighter requirements.

At this time last year, only the Navy's F/A-18 was fully certified for unrestricted refueling with the KC-46. Additionally, at this time last year, no KC-46s were or had been presented to USTRANSCOM for tasking.

Beginning last July, the Interim Capability Release Program (ICR) allowed USTRANSCOM to "task" KC-46s to support approved receivers under the plan. Since then, continued approval of additional receivers has led to the KC-46 being cleared for 85% of missions tasked by USTRANSCOM. These additional approvals include bombers, tankers, airlift, ISR and fighters (F-15, F-16, F-18, F-22 and F-35). The KC-46 is now also capable of being tasked to conduct passenger and aeromedical evacuation missions.

KC-46 aircraft have conducted nearly 9000 missions since January 2019 with US and coalition receivers delivering nearly 80 million pounds of fuel through over 37,000 safe and effective aerial refueling contacts. Within the next few months, additional receivers will likely be approved via the ICR process, allowing nearly all boom-compatible receivers to be refueled by the KC-46 except the A-10 and some Air Force Special Operations Command C-130 aircraft. This alleviates pressure on legacy tanker fleets and allows some continued legacy divestiture.

The FY23 President's budget requests $186.2 million in RDT&E funding for the ongoing KC-46 Engineering and Manufacturing Development and post production modification efforts, to include the boom telescope actuator redesign that resolves the stiff boom deficiency, on-going test and receiver aircraft certifications, and increased effort on the KC-46 Block 1 program. Additionally, the budget requests $2.83 billion not only to procure 15 aircraft in Production Lot 9 along with associated engines, spares, and support equipment, but also to support increased depot standup and organic sustainment.

KC-10 and KC-135

The average age of our KC-135 and KC-10 tankers is 59 and 35 years old, respectively. Both fleets are challenged by aircraft parts obsolescence and diminishing manufacturing source issues. With the help of organic Air Force depots and industry, we are able to maintain these platforms as effective and safe weapon systems for the warfighter. We are executing several key modernization, safety, and compliance initiatives to ensure our KC-135 fleet remains viable beyond 2040.

The FY23 President's budget request will continue KC-135 modernization efforts, including the Block 45 program, the Aero-I Satellite Communications (SATCOM) program,

Mobile User Objective System, Real Time in Cockpit, and the Rudder Position Indicator program. The Air Force is also funding three new modernization efforts in FY23, including two radio upgrades and Center Console Refresh.

Additionally, the budget requests funding to keep our KC-10 fleet operational through its planned retirement at the end of FY24, and includes funding for service bulletins and low cost modifications to ensure Federal Aviation Administration certification.

The Air Force FY23 budget request proposes decreasing its tanker fleet from 479 Total Active Inventory to 455 by the end of FY27. In FY23, the Air Force is retiring 14 KC-10s and 18 KC-135s from the Active Duty fleets. These retirements are critical in providing the flexibility to free up resources and manpower to modernize and fund the Air Force's future tanker fleet.

Executive Airlift

VC-25B

The VC-25B program will replace the U.S. Air Force Presidential VC-25A fleet, which faces capability gaps, rising maintenance costs, and parts obsolescence as it ages beyond 30 years. The VC-25B program will deliver two new aircraft to meet the requirements for the President to execute the roles of Head of State, Chief Executive, and Commander-in-Chief. Two Boeing 747-8 aircraft are being uniquely modified to provide the President, staff, and guests with safe and reliable air transportation and a level of communications capability and security equivalent to that which is available in the White House. Modifications to the 747-8 aircraft began in February 2020 in San Antonio, Texas, and include an electrical power upgrade, dual auxiliary power units that are usable in flight, a mission communication systems, an executive interior, military avionics, a self-defense system, autonomous enplaning and deplaning, and autonomous baggage loading.

The FY23 President's budget requests $493 million to continue Engineering and Manufacturing Development, aircraft modifications, and other product support activities.

C-40

The C-40 is a modified 737-700 Boeing Business Jet used to provide safe and reliable global air transportation for U.S. officials, including members of the Executive and Legislative branches of government, as well as other Defense officials. The fleet has been undergoing communications upgrades to ensure secure and robust communications that meet Executive-level requirements. The FY23 President's budget reflects $2.2 million in procurement funding to

address low cost modifications and service bulletins in order to provide secure and reliable government air transportation to these passengers.

Strategic and Tactical Airlift

C-5

The C-5 Super Galaxy provides all-weather worldwide strategic airlift for combat forces, equipment, and supplies, exemplifying Rapid Global Mobility as outlined in the NDS. Current investment programs focus on fleet obsolescence, maintainability, and safety of flight.

The FY23 President's budget requests $46.0 million in procurement funding, predominantly for communications, navigation, surveillance/air traffic management (CNS/ATM) and core mission computer/weather radar (CMC/WxR) system equipment. CNS/ATM upgrades include Automatic Dependent Surveillance-Broadcast (ADS-B) Out modifications required for global airspace compliance. The CMC/WxR effort replaces an antiquated radar system and upgrades the core mission computer processor to meet the demands of future software modifications. Production funding also includes procurement of training systems.

Additionally, the FY23 President's budget requests RDT&E funding to support replacement of the Multifunctional Controls and Displays (RMCD). This comprehensive sustainment modification mitigates the obsolescence of the current control and display units and increases capacity for future technology integration into the cockpit.

C-17

The C-17 is the only aircraft in the Air Force inventory that combines tactical capability with strategic range to operate from austere airfields. The fleet of 222 aircraft provides our Nation with unmatched flexibility to conduct theater and inter-theater direct delivery, airdrop, aeromedical, and special operations airlift missions. Agile and efficient software and hardware updates ensure timely readiness, safety, and capability improvements as this premier airlift platform contributes to our national security objectives.

The FY23 President's budget requests $152.0 million in procurement funding to continue critical modifications to the C-17 fleet. This includes a filter fire mitigation for the On-Board Inert Gas Generating System, Large Aircraft Infrared Countermeasures defensive systems, and training system upgrades. The modification effort of a replacement heads-up display will address obsolescence of the current C-17 heads-up display and improve the system's availability,

reliability, and maintainability. Production funding also includes procurement of training systems.

Additionally, FY23 RDT&E funding will address obsolescence and flight safety issues. The Beyond-Line-of-Sight communication system effort modernizes multi-channel voice and data communication subsystems to ensure the C-17 keeps pace with changes in Department of Defense communication infrastructure, and begins production in FY23.

C-130H/J Fleet

The C-130 fleet consists of C-130H and newer C-130J aircraft, as well as special mission aircraft (AC/LC/EC/MC/HC/WC-130s). 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.

C-130H

The Air Force continues to modernize the C-130H fleet through a four-pronged approach emphasizing aircraft safety, airspace compliance, modernization, and partial recapitalization. Our C-130H Center Wing Box replacement program breathes new life into some of our hardest flown aircraft, enabling them to continue to safely operate well into the future. The C-130H Avionics Modernization Program (AMP) Increment 1 ensures the C-130H fleet is outfitted with modern communication equipment and complies with U.S. and international airspace transponder mandates. We completed the AMP Increment 1 installations for the C-130H fleet in May 2021. The AMP Increment 2 program improves the C-130H fleet maintainability and reliability by providing a new digital avionics suite and mitigating obsolescence and diminishing manufacturing source challenges. The FY23 President's budget requests $0.4 million in RDT&E and $115.4 million in procurement funding to support the C-130H fleet.

As with other weapon systems, the Air Force is taking measured risk in the C-130 portfolio as it focuses resources toward the future force. Specifically, in FY23 we plan to reduce the total C-130 fleet from 279 aircraft to 271 aircraft (110 C-130Hs and 161 C-130J aircraft).

C-130J

The Air Force has partially recapitalized the C-130H fleet with C-130Js, which also supports our Special Operations missions by providing Special Forces with extra weight carrying capacity, longer range, and better fuel efficiency. These special mission variants of the C-130J

conduct airborne psychological operations and offensive electronic warfare (EC-130J), weather reconnaissance (WC-130J), search and rescue (HC-130J), and special operations (MC-130J and AC-130J). The Air Force has multiple modification efforts for the C-130J, including Center Wing Box replacement, Large Aircraft Infrared Countermeasures, Block 8.1, and communications upgrades. The C-130J Block 8.1 modernization program, currently in production, delivers new communication and data link capabilities, a modern flight management system, and other key capabilities to the field. In addition, the Air Force plans to upgrade both our C-130H and C-130J fleets with a Mobile User Objective System and a Second Generation Anti-Jam Tactical Ultra High Frequency Radio satellite communication system to ensure we maintain key communication links anywhere in the world.

The FY23 President's budget requests $11.1 million for C-130J RDT&E and $187.6 million for C-130J procurement and modification efforts. The FY23 President's budget also requests funding for HC/MC-130J RDT&E and HC/MC-130J procurement and modification efforts.

Rotorcraft

The FY23 President's budget continues investment in the Air Force's critical rotorcraft modernization programs, including the CV-22 Osprey, HH-60G, HH-60W, and MH-139A programs.

CV-22

The CV-22 is the Air Force variant of the joint V-22 tilt-rotor aircraft. It allows for long-distance, terrain following, vertical lift operations with increased survivability and is the only high-speed vertical lift platform in the Air Force inventory. The CV-22 conducts infiltration, exfiltration, and resupply of Special Operations Forces (SOF) in politically sensitive and hostile or denied areas. The FY23 President's budget requests $165.4 million to continue modifications to increase CV-22 fleet reliability, capability, and survivability. Investments in these areas will ensure the CV-22 fleet remains ready, reliable, and relevant in the future.

HH-60G and HH-60W (Combat Rescue Helicopter)

The Air Force is the only Service with a dedicated force organized, trained, and equipped to execute theater-wide Personnel Recovery. The HH-60G fleet currently accomplishes this mission by conducting day, night, and marginal weather Combat Search and Rescue (CSAR) operations to recover isolated personnel in hostile or permissive environments. Due to the

advancing age and current attrition rates of the HH-60G, the Air Force must continue to sustain existing HH-60G helicopters and use aircraft procured under Operational Loss Replacement program to meet Combatant Command requirements until we can fully recapitalize with the HH-60W (Combat Rescue Helicopter (CRH)) program. The HH-60W will be specifically equipped to conduct CSAR across the entire spectrum of military operations. The FY23 President's budget request reduces the total fleet to 75 air vehicles from the program of record of 113. The Air Force has fully funded the CRH program to meet National Military Strategy objectives through Personnel Recovery missions. The FY23 President's budget requests $10.8 million and $928.8 million for the HH-60G and HH-60W programs, respectively.

MH-139A

The MH-139A program is an element of the Air Force nuclear enterprise reform initiative and also supports operational airlift within the National Capital Region. This program will deliver up to 80 replacement helicopters, training devices, and associated support equipment to replace the legacy UH-1Ns. The FY23 President's budget requests $185.4 million for the MH-139 program, which will fund Low Rate Initial Production, training devices, and support equipment. It also funds the MH-139A Performance Enhancements and Product Improvements Program, which is the development of solutions to solve capability gaps found during the development and test of the MH-139A. This includes solving communication and weapon systems deficiencies, improving mission planning compatibility, resolving usability concerns, and other critical capabilities. The first six aircraft continue to be used to finalize test and development.

Intelligence, Surveillance, and Reconnaissance

The Air Force is focusing Intelligence, Surveillance, and Reconnaissance (ISR) resources on efforts that provide high quality tracking and target coordinates, establish meaningful data nodes to give tactical direction, and optimize weapon systems with information that matters in the most useful formats, at speed and scale. To meet the challenges of a highly contested environment, the future ISR portfolio will consist of a multi-domain, multi-intelligence, collaborative sensing grid that uses advanced technology. The end goal is a ready Next Generation ISR Enterprise possessing a decisive advantage for the warfighter while remaining competent across the entire spectrum of conflict.

The ability to win future high-end conflicts requires accelerating investment to transition our ISR force structure into a connected, persistent, and survivable force. To achieve this, we must move away from expensive legacy systems that offer limited capability against future competitors. The FY23 President's budget request takes further steps towards repurposing, retooling, automating, and stabilizing the force to ensure the ISR Enterprise can achieve this vision within the next decade.

MQ-9

The FY23 President's budget request of $208.2 million will continue MQ-9 fleet modernization efforts aimed at providing needed capabilities to the Combatant Commands. To date the MQ-9 fleet has flown over 2.75 million hours, with approximately 91% of those hours supporting combat operations. This level of warfighter support is facilitated by a unique program architecture in which MQ-9 sustainment and modernization efforts are managed as separate, yet fully integrated and complementary, programs of record. This allows the Air Force to focus on operating and sustaining fielded MQ-9s while development and testing of planned modernizations are conducted in parallel. By structuring this way, mature and proven upgrades for the program at large are delivered when and where they are needed.

MQ-9 modernization efforts include the continued development of MQ-9 Multi-Domain Operations (M2DO) capability upgrades that will keep the fleet relevant. The upgrades in the M2DO configuration include Anti-jam GPS, Command and Control Resiliency, Enhanced Power, Link-16, and an effective and reliable open systems architecture.

The FY23 President's budget request removes 250 aircraft from the inventory over the FYDP. The Air Force will first remove all Block 1 aircraft between FY23 and FY24, and then will remove high time Block 5 aircraft between FY26 and FY27. The remaining fleet of 140 Block 5 aircraft will continue to meet Combatant Command requirements.

RC-135

The Air Force is committed to sustaining and upgrading the RC-135 fleet as it continues to be our most capable, relevant, and viable signals intelligence platform. Continued modernization using rapid acquisition and fielding processes is critical as we address emerging peer threats and great power competition. The RC-135 is critical to our decision advantage as it provides vital intelligence data at unrivaled speeds to both the national-level intelligence community and the tactical-level warfighter today and in any future highly contested conflict.

The FY23 President's budget request facilitates mission system improvements for the RC-135 variant fleet. Efforts include the automation of additional search and detection capabilities, improved near-real-time data distribution and collaborative processing, and exploitation and dissemination supported by enhanced artificial intelligence algorithms. Also, the second and third KC-135 to WC-135 conversions will be accomplished and delivered in FY23. Finally, the recent extension of the standard-setting RC-135 cooperative agreement with the United Kingdom's Royal Air Force (RAF) to 2035, as well as the integration of RC-135 derived sensor technologies on the Australian Royal Australian Air Force (RAAF) MC-55 Peregrine, continue to strengthen alliances globally while increasing partner interoperability.

RQ-4

The RQ-4 Global Hawk remotely piloted aircraft system provides high altitude, long endurance, all weather, wide area reconnaissance and surveillance. The FY23 President's budget request of $116 million will maximize Block 40 utility through the remainder of the Global Hawk service life, to include fielding the modernized ground segment and addressing diminishing manufacturing sources issues.

The Ground Segment Modernization Program is on track to complete installation of upgraded cockpits at Grand Forks Air Force Base and Beale Air Force Base in FY23. Finally, the Air Force plans to divest Block 40 by FY27, at which time space-based Ground Moving Target Indicator is expected to meet Combatant Commander's needs in accordance with the NDS. The reduced investment in the RQ-4 also enables the Department to better align resources with the NDS.

EC-37B COMPASS CALL

COMPASS CALL is the Air Force's only wide-area, standoff, Airborne Electromagnetic Attack (AEA) Command and Control Warfare/Information Operations weapon system. The COMPASS CALL program is currently undergoing a re-host effort to transition the capability from the EC-130H to the EC-37B in order to maintain U.S. Electromagnetic Spectrum (EMS) Superiority in future conflicts. To date, six EC-37B aircraft have been procured and are undergoing modification, with limited fielding for training only in FY24, and initial operational fielding in FY26.

The Air Force has included procurement of the last four planned EC-37Bs as part of the FY23 Unfunded Priority List (UPL). Additionally, the FY23 PB accelerates development of the

mission system upgrade for the fielding of System Wide Open Reconfigurable Dynamic Architecture (SWORD-A) capabilities. The open and agile architecture of SWORD-A will enable a more rapid response capability against emerging threats and will be included on aircraft number six initially and then to the first five aircraft as an upgrade modification.

E-8C JSTARS

The E-8C JSTARS provides wide-area Ground Moving Target Indicator (GMTI) capability and dynamic Battle Management Command and Control (BMC2). JSTARS aircraft will have survivability challenges in future scenarios, as airborne GMTI platforms have to operate closely (from within contested areas) to adequately sense ground moving targets. The future of the GMTI is a pivot to space. Additionally, this pivot is imperative due to the increasingly prohibitive cost to sustain the platform and maintain a relevant capability across the spectrum of operations. As such, the Department is transitioning from legacy airborne GMTI platforms to space-based capabilities, where sensing will be possible in anti-access/area denial (A2/AD) scenarios. As part of this transition, the Air Force began divestiture of the JSTARS fleet in FY22 and will divest eight aircraft in the FY23 President's budget request, leaving three aircraft in the active fleet.

E-3 AWACS

The E-3 AWACS provides wide-area Airborne Moving Target Indicator (AMTI) capability and dynamic Battle Management Command and Control (BMC2) to build an accurate battlespace picture. Despite modernization efforts, the aging E-3 AWACS offers limited operational utility in contested conflicts, creating an operational imperative to replace it. The AMTI capability of the E-3 AWACS presents a significant capability gap with no present long term Air Force capability to compete in the high end fight. The E-3 Replacement program will close the capability gap by enabling the long range kill chain, enhancing reliability and availability, and reducing operating costs by integrating a modern Electronically Scanned Array sensor on a crewed platform. An electronically scanned array will be capable of radar beam steering, sector staring, and much faster target revisit rates that translate into better target detection and tracking of modern threats, as well as more robust Electronic Protection not possible with the mechanically scanned radar on the E-3 AWACS. The FY23 President’s budget request begins the transition to the more capable E-7A platform by divesting the first 15 E-3 aircraft in FY23. This fleet reduction will allow the Air Force to concentrate resources and

improve E-3 aircraft availability rates, while efforts to procure the E-7A are underway. Full fleet divestment is currently scheduled to occur by FY29; therefore, most E-3 modernization programs are being terminated except mandated requirements for crypto and communication systems as well as safety of flight efforts. The FY23 President's budget request of $67 million funds these efforts to maintain existing AWACS BMC2 capabilities. For the E-3 Replacement program, which will be the E-7A, the FY23 President's budget request funds the development and delivery of two production representative prototype aircraft to support test and evaluation, and associated ground support and training systems.

Connecting the Joint Force

One effort that will stress how fast and smart our requirements, acquisition, and operations process can move is Joint All-Domain Command and Control (JADC2) powered by the Advanced Battle Management System (ABMS). Charged by the Secretary of Defense with leading the concept development for JADC2, the Department of the Air Force is building ABMS to create decision superiority by delivering relevant information and capabilities to warfighters and operators at all echelons. ABMS will integrate today's and tomorrow's sensors; develop applications embedded with artificial intelligence, sophisticated algorithms, and multi-layered protections to make sense of massive amounts of trusted data; link space capabilities with weapons systems and personnel across all domains; and design pods, platforms, pathways, procedures, and policies that connect and integrate the warfighter better and faster than in any time in our history.

Operationally optimized ABMS/JADC2 is one of the Secretary of the Air Force's Operational Imperatives (OIs) and is a foundational capability in many other OIs. The ABMS acquisition effort will pursue two interconnected investment paths: enduring digital infrastructure investments and Capability Release packages, which leverage those enduring investments but focus on closing kill-chains and delivering immediate operational capability. The Department of the Air Force (DAF) Rapid Capabilities Office (RCO) is working in conjunction with the wider acquisition community to ensure Air Force and Space Force systems have seamless interoperability and compatibility to meet the JADC2 operational requirements. The six ABMS capabilities required to connect the warfighter are secure processing, connectivity, data management, applications, sensor integration, and effects integration.

Driven by requirements approved by the Chief of Staff of the United States Air Force and the Chief of Space Operations, Capability Release #1 (CR #1) (Airborne Edge Node) connects select tactical assets and C2 functions to the transport layer and the ABMS digital infrastructure at the tactical edge, enhancing situational awareness and decision making at the tactical, operational, and strategic levels.

Thank you again for the opportunity to testify. We look forward to working with this subcommittee to ensure the Department of the Air Force maintains sufficient military advantage to secure our vital national interests and support our allies and partners in Fiscal Year 2023 and beyond.