



United States Air Force

Report to Congressional Committees

2025 Air Test and Training Range Enhancement Plan

January 2014

Preparation of this study cost the
Department of Defense a total of approximately
\$60,800 in Fiscal Years 2012 - 2014



Introduction

This report is being provided to the congressional defense committees as directed in Section 343 of Public Law 112-81, the National Defense Authorization Act for Fiscal Year 2012.

SEC. 343 STUDY ON AIR FORCE TEST AND TRAINING RANGE INFRASTRUCTURE

(a) *STUDY.*—

(1) *IN GENERAL.*—*The Secretary of the Air Force shall conduct a study on the ability of the major air test and training range infrastructure, including major military operating area airspace and special use airspace, to support the full spectrum of Air Force operations. The Secretary shall incorporate the results of the study into a master plan for requirements and proposed investments to meet Air Force training and test needs through 2025. The study and the master plan shall be known as the “2025 Air Test and Training Range Enhancement Plan.”*

(2) *CONSULTATION.*—*The Secretary of the Air Force shall, in conducting the study required under paragraph (1), consult with the Secretaries of the other military departments to determine opportunities for joint use and training of the ranges, and to assess the requirements needed to support combined arms training on the ranges. The Secretary shall also consult with the Department of the Interior, the Department of Agriculture, the Federal Aviation Administration, the Federal Energy Regulation Commission, and the Department of Energy to assess the need for transfers of administrative control of certain parcels of airspace and land to the Department of Defense to protect the missions and control of the ranges.*

(3) *CONTINUATION OF RANGE INFRASTRUCTURE IMPROVEMENTS.*—

The Secretary of the Air Force may proceed with all - infrastructure improvements while conducting the study required under paragraph (1).

(b) *REPORTS.*—

(1) *IN GENERAL.*—*The Secretary of the Air Force shall submit to the congressional defense committees an interim report and a final report on the plan to meet the requirements under subsection (a) not later than one year and two years, respectively, after the date of the enactment of this Act.*

(2) *CONTENT.*—*The plan submitted under paragraph (1) shall—*

(A) document the current condition and adequacy of the major Air Force test and training range infrastructure in the United States to meet test and training requirements;

(B) identify potential areas of concern for maintaining the physical safety, security, and current operating environment of such infrastructure;

(C) identify potential issues and threats related to the sustainability of the test and training infrastructure, including electromagnetic spectrum encroachment, overall bandwidth availability, and protection of classified information;

(D) assess coordination among ranges and local, state, regional, and federal entities involved in land use planning, and develop recommendations on how to improve communication and coordination of such entities;

(E) propose remedies and actions to manage economic development on private lands on or surrounding the test and training infrastructure to preserve current capabilities;

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- (F) identify critical parcels of land not currently under Air Force control for acquisition of deed or restrictive easements to protect current operations, access and egress corridors, range boundaries, or to expand the capability of the air test and training ranges;*
 - (G) identify which parcels identified pursuant to subparagraph (F) could, through the acquisition of conservation easements, serve military interests while also preserving recreational access to public and private lands, protecting wildlife habitat, or sustaining opportunities for energy development and energy transmission;*
 - (H) prioritize improvements and modernization of the facilities, equipment, and technology supporting the infrastructure in order to provide a test and training environment that accurately simulates the full spectrum of threats and targets of likely United States adversaries in 2025;*
 - (I) incorporate emerging requirements generated by requirements for virtual training and new weapon systems, including the F-22, the F-35, space and cyber systems, and Remotely Piloted Aircraft;*
 - (J) assess the value of state and local legislative initiatives to protect Air Force test and training range infrastructure;*
 - (K) identify parcels with no value to future military operations;*
 - (L) propose a list of prioritized projects, easements, acquisitions, or other actions, including estimated costs required to upgrade the test and training range infrastructure, taking into consideration the criteria set forth in this paragraph; and*
 - (M) explore opportunities to increase foreign military training with United States allies at test and training ranges in the continental United States.*
- (3) FORM.—Each report required under this subsection shall be submitted in unclassified form, but may include a classified annex as necessary.*
- (4) RULE OF CONSTRUCTION.—The reports submitted under this section shall not be construed as meeting the requirements of section 2815(d) of the Military Construction Authorization Act for Fiscal Year 2000 (Public Law 106-65; 113 Stat. 852).*

Executive Summary

This final report meets the requirements of Section 343 of Public Law 112-81, the National Defense Authorization Act for Fiscal Year 2012. The Air Force submitted the required interim report in January 2013. This report identifies six emphasis areas for improving the condition and adequacy of our range enterprise. These emphasis areas serve as our priorities for improvement and modernization efforts to include meeting emerging requirements generated by new technology and weapon systems. It also discusses physical and electromagnetic encroachment concerns, as well as the inter-agency processes developed to address these concerns. Additionally, this report discusses the processes used to foster compatible land use around our test and training ranges.

Preservation of Air Force test and training space is a dynamic and on-going endeavor. The Air Force routinely and successfully partners with our sister services and other local government agencies through established processes which are described within this report. Those other agencies include: the Department of Interior, the Department of Agriculture, the Federal Aviation Administration, the Federal Energy Regulatory Commission, the Department of Energy, the Department of Commerce, the Department of Homeland Security, numerous state and local governments and industry groups.

The Air Force views the major range and test facility base ranges as irreplaceable national assets and the primary training range enterprise as an important component of combat readiness. This report addresses six priorities which are critical to ensuring the viability of this range infrastructure through 2025:

Posturing for the new defense strategy;

Enhancing capabilities to support 5th generation aircraft and associated weapons;

Fostering compatible development;

Integrating space and cyber capabilities;

Institutionalizing Air Force special operations forces range requirements; and

Reducing range congestion and maximizing capacity through better business practices and innovative partnerships.

Report

Introduction

The Air Force test and training range enterprise consists of major range and test facility base (MRTFB) ranges and primary training ranges (PTR). The MRTFB ranges encompass the largest, most fully-equipped ranges, designed to test and evaluate capabilities to support the Department of Defense (DoD) acquisition system. The MRTFB ranges also support operational training as capacity allows. The PTRs are typically smaller, less-equipped ranges, designed to support the routine continuation-training of combat units. These ranges are comprised of over seven million acres of land, one million cubic miles of special use airspace and an extensive array of equipment to support test and training.

The Air Force views the MRTFB ranges as irreplaceable national assets and the PTR enterprise as an important component of combat readiness. This report addresses six priorities which are critical to ensuring the viability of our range infrastructure through 2025:

- Posturing for the new defense strategy;

- Enhancing capabilities to support 5th generation aircraft and associated weapons;

- Fostering compatible development;

- Integrating space and cyber capabilities;

- Institutionalizing Air Force special operations forces range requirements; and

- Reducing range congestion and maximizing capacity through better business practices and innovative partnerships.

Posturing for the New Defense Strategy

ASSESSMENT: For over twenty consecutive years, the Air Force conducted combat and combat support missions in the U.S. Central Command (USCENTCOM) area of responsibility. For the last decade, our forces have been heavily engaged in Operation IRAQI FREEDOM and Operation ENDURING FREEDOM. Our range enterprise adapted to the demands of these conflicts and evolved rapidly to supply a test and training environment consistent with the demands of operations in Iraq and Afghanistan. Our enterprise focused prominently on counter-insurgency operations, desert and mountainous terrain, urban terrain complexes and the incorporation of low-tech targets and simulated threats.

The new Defense Strategic Guidance requires re-focusing for operations against a more technologically advanced peer adversary. These potential adversaries possess complex air defenses and highly-sophisticated electronic countermeasures, including global positioning

system (GPS) and radar jamming capabilities. Our current range enterprise does not adequately replicate this environment. To provide the realistic training required for combat-ready aircrews, the Air Force must upgrade range infrastructure at select ranges to accurately reflect the complex, dense combat environment crews will likely encounter during operations. These upgrades include realistic integrated air defenses, target arrays compatible with advanced sensors, high-fidelity moving targets, and the ability to conduct operations in a contested and/or degraded environment.

ACTION: Constructing a training environment which adequately represents a technologically advanced adversary is a costly endeavor. Therefore, the Air Force cannot afford to invest in this level of infrastructure at all of our training ranges. Instead, we must focus our investment in live infrastructure at a few select ranges which will become hubs for intermediate to advanced training. The first of these ranges is the Nevada Test and Training Range (NTTR). The Air Force Warfare Center is developing a strategic plan to guide investment in capabilities to allow the NTTR to more accurately replicate current threat environments of our new defense posture.

The Air Force is supporting these efforts through collaboration with the DoD and the Department of the Navy to develop and field the Advanced Radar Threat System version 1 (ARTS1) and Advanced Radar Threat System version 2 (ARTS2). These systems provide a more realistic training environment because they will close the gap between our current and required threat simulation capabilities. - This development effort (also known as the Electronic Warfare Infrastructure Improvement Program (EWIIP)) uses a significant portion of the approximately \$550 million effort to develop and field 25 open air range threat simulators representative of advanced threat systems in the Western Pacific Region.

ACTION: In support of test objectives aligned to the new defense strategy, the Air Force works with the Department of Defense on MRTFB posturing activities through the Central Test and Evaluation Investment Program (CTEIP). CTEIP allocates a portion of its resources annually to the Resource Enhancement Project (REP), which addresses high-priority near-term operational test needs for the different Services. Currently the Air Force has REP projects developing near-term improvements to modeling and simulation (M&S) of threat representative integrated air defense systems and additional GPS high power jamming assets to support operational test of GPS degraded environments.

Enhancing Capabilities to Support 5th Generation Aircraft and Associated Weapons

ASSESSMENT: The technological advances incorporated in 5th generation aircraft and associated weapons represent an unprecedented leap in combat capability. These advances allow crews to identify and engage multiple targets from greater distances with improved accuracy. The technology of precision-guided munitions has generally shifted the focus of training from weapon employment to target identification, subsequently increasing the complexity of the targets required to accomplish realistic training. The greater employment distances of these weapon systems add another stressor to range management as individual sorties require larger portions of the range and airspace to train safely and effectively.

The Air Force believes these advances will change the nature of training. There will be diminishing requirements to drop live subscale and heavyweight munitions but a greater need to practice target identification. Additionally, the most advanced training will take place in the simulator further transforming range demands. While tactics, techniques and procedures for 5th generation aircraft are still evolving, greater volumes of airspace may be required due to flight envelopes, tactical airspeeds and employment tactics.

Our range enterprise presently meets the live-training requirements for the current blocks of 5th generation aircraft, but programmed advances in platform and sensor capability and standoff weapon ranges will soon exceed the capability of our range enterprise to provide the superior live-training environment that has long been a U.S. strategic advantage in combat readiness.

ACTION: Providing a live test and training environment for 5th generation aircraft and advanced sensors requires costly infrastructure and, in some cases, greater area of land and volume of airspace than legacy systems. The methods of providing a 5th generation test and training environment are similar to the methods of posturing for the new defense strategy allowing us to meet both needs simultaneously. Therefore, the ranges which are improved to meet the demands of the new defense posture will also be tailored to meet the demands of 5th generation training.

As stated earlier, the Air Force intends to invest in NTTR and the ARTS program which will provide a suitable environment for live-training and tactics development, however realistically replicating a technologically advanced adversary in a live environment is cost prohibitive and will depend upon investments in constructive and virtual capabilities to fill the gaps. Likewise, a robust virtual and constructive environment will be essential to exercise those mission sets that would be susceptible to intelligence gathering in a live environment. These capabilities will allow aircrews to conduct complex training in networked simulators or by creating virtual threat environments within the cockpits of live aircraft. As we field the F-35, the Air Force will explore opportunities to increase live, virtual and constructive training with our partner nations. This will include exploring synergies in initial training, as well as long term training constructs to maximize range utilization. The initial training concept of operations will not be available until 2015; therefore we will not see the results of this effort for some time.

ACTION: Substantial improvements in test systems and infrastructure are being planned to support future 5th generation aircraft and weapon operational requirements. To accomplish this, the Air Force utilizes both Service specific and DoD funded investment programs. The previously mentioned EWIP invests approximately \$50 million in upgrades to the F-35 U.S. Reprogramming Laboratory enhancing the capability of the F-35 electronic warfare suite for testing, training, and future combat operations.

Of particular importance in test and training of 5th generation aircraft and weapons in general is the Title 10 mandate for Live Fire testing. Aerial targets represent the only means to satisfy this type of testing and improvements in aircraft and threat simulation capability are

currently being assessed and pursued. The Air Force currently uses three platforms for Live Fire Testing. The full scale targets include the QF-4 (being phased out) and the QF-16 (being phased in). Both of these aircraft provide realistic targets for current test and training purposes. Investigations are currently being conducted to assess if enhancements will enable these platforms to adequately simulate 5th generation type adversaries or if a new full scale target development is needed. The Air Force also uses a sub-scale aerial target when full scale articles are less suitable. The BQM-167 is a configurable aerial platform that can be modified to meet the test and training target requirements for today's missile technology. Coincidental with target procurements, the Gulf Test and Training Range is investing in upgrades to its drone control systems. These enhancements will provide greater coverage of the Gulf Test and Training Range for multiple drone control and allow mission playback.

The Air Force also leverages the CTEIP program for test range investments. This program invests in test and evaluation capabilities that will meet the test requirements of more than one DoD Component. CTEIP provides a coordinated process for funding test and evaluation (T&E) investments that leverage DoD component investments and encourage joint development and use of new test capabilities. Currently the Air Force leads two large CTEIP projects that will support future 5th generation aircraft and associated weapons system requirements.

- The Common Range Integrated Instrumentation System (CRIIS) project will provide most MRTFB facilities with the capability to collect highly accurate time, space, position information and selected aircraft data bus information needed for advanced weapon systems testing. The enhancements provided by CRIIS enable interoperability across the major test ranges and support future F-35 testing.
- The integrated Network Enhanced Telemetry project will provide test ranges with a networked telemetry capability that will support testing of increasingly complex weapons systems despite growing constraints on radio frequency spectrum availability.

Fostering Compatible Development

ASSESSMENT: The competing national priorities of energy independence, nationwide broadband and a strong defense often manifest themselves on Air Force ranges. The geographic boundaries of these ranges were designed to centralize hazardous activity in locations with little impact to the general populace. As the Nation pursues energy independence, these once isolated test and training ranges are often in the midst of prime development areas for renewable energy and urban growth. The traits which make them ideally suited for Air Force test and training make them valuable to solar and wind energy developers. The resulting development outside of range boundaries can degrade the capability to effectively test and train inside the range boundaries. This is particularly evident when the Doppler Effect from wind turbines off-range degrade critical test capabilities and affect the accuracy and reliability of radar systems used on the range .

A rapidly growing challenge is the increased competition for frequency spectrum, particularly the high demand for broadband access to once reserved military spectrum. Air Force ranges and the weapon systems which operate in them are equipped with advanced equipment that rely on the availability of specific and sometimes pristine frequency bands for telemetric test data, real-time monitoring of training, quality and timely debrief, digital communication between airborne assets and ground stations and tactics, techniques and procedure development. Some of these systems are assigned to frequencies located in bands currently under consideration for auction to commercial entities, potentially impacting test and training capability.

An emerging challenge is the increasing presence of foreign business interests in the vicinity of our sensitive test and training ranges. When foreign companies build or acquire energy and mining projects near Air Force ranges, they gain the ability to maintain a permanent presence near areas vital to national security which affords them an opportunity to collect critical information regarding national defense programs.

ACTION: The Air Force does not have the direct ability to make an independent determination on the outcome of any potentially incompatible development project off of Air Force property, and therefore relies on other government agencies with regulatory authority. The Air Force is proactively engaged with the Office of the Secretary of Defense (OSD), other Services, interagency partners, and industry to address the demands of compatible development. Through the OSD Energy Siting Clearinghouse, the Air Force responds to renewable energy development proposals, works with developers to mitigate any operational impacts, and appeals to agencies with regulatory authority for objections to projects when mitigation is not possible. Additionally, each Air Force installation is tasked to develop an Installation Complex Encroachment Management Action Plan. Through these plans, units identify specific engagement actions needed to address potential encroachment issues including land development, electromagnetic interference and protection of classified information.

In some circumstances, the Air Force identifies specific parcels of off-range land which, if developed incompatibly, would negatively impact range operations. Concerns are site-specific, but often include wind turbine impacts to radar, the impact of excessive lighting on night vision device training and urban development near safety zones or high-noise impact areas. Depending on the circumstances, the Air Force uses a variety of tools to promote compatible use, such as the Readiness and Environmental Protection Initiative (REPI) program, restrictive easements and engagement with local zoning agencies. Through these processes, DoD consults with numerous federal and non-governmental agencies including the Department of Interior, Department of Agriculture, the Federal Aviation Administration, the Federal Energy Regulation Commission, the Department of Energy and the Department of Commerce. Air Force interest in non-DoD lands is a sensitive issue requiring a robust process to balance the operational requirements for DoD use of such lands with community needs and interests. For this reason, this report does not list unvetted parcels of land which may be of interest to local units. The Air Force vets these proposals through the REPI program. Recent REPI efforts included three initiatives designed to preserve lands surrounding Air Force ranges. The first of these initiatives secured 1382 acres of land near

the Avon Park Range in Florida. Easements on these lands will protect approach and departure corridors, provide an adequate noise buffer, and limit lighting which could interfere with night vision device training. A second initiative secured 5,959 acres of undeveloped land in North Carolina near the Dare County Bombing Range. Easements on this land will preserve access to restricted airspace and training routes critical to range operations. The third initiative seeks to preserve land adjacent to the Eglin Range in Florida to protect low-level approaches and accident potential zones for Joint Strike Fighter operations. To date, 2,199 acres have been secured near the Eglin range. As training requirements evolve, the Air Force will regularly review land use concerns. Any parcels of land identified as critical to preserving operational capabilities will be vetted through the Air Force Encroachment Management Program.

In addition to the REPI program, Air Force units maintain a robust relationship with state and local governments. These relationships often facilitate awareness of incompatible development and afford the Air Force an opportunity to express concerns and discuss potential mitigation with developers early in their planning process. Some states and local zoning boards have passed legislation to mandate consultation with local DoD units prior to approving development proposals, however most localities still rely on ad hoc processes and relationships. The Air Force is supportive of efforts to codify the consultation process at the local and state levels to facilitate a balance between preserving range capabilities and fostering economic development.

Another established mechanism for the evaluation of land requirements is the renewal process governed under Public Law 106-65, Section 3016. Through this process, the Air Force is required to notify Congress and the Secretary of the Interior of the continued requirement for withdrawn lands. The Air Force would use this process to identify any parcels of land with no future value to the military.

ACTION: As previously mentioned, spectrum encroachment has become an emerging issue for Air Force test and training operations. The Air Force participates in the Commerce Spectrum Management Advisory Committee Working Group, a collaborative effort between government and industry, to explore innovative solutions to the spectrum congestion challenges. In addition, in response to the FCC's rulemaking proceedings to repurpose the 1755 – 1780 MHz band for commercial broadband, the Air Force and DoD are working to develop transition plans to enable commercial access while protecting essential test and training capabilities, such as Aeronautical Mobile Telemetry and Air Combat Training Systems. The technology challenges associated with this change are achievable but when combined with the increasing budgetary constraints presents formidable future scheduling hurdles.

Spectrum encroachment is also a factor for a unique Air Force test capability associated with assessing radar cross sections of 5th generation aerial platforms. As new stealth aircraft technologies and designs emerge, the National Radar Test Facility (NRTF) is encountering more challenging requirements and environments for its testing in this area. Unlike most test processes, low observable technologies cannot be simulated or accurately scaled down for testing. This process requires full scale models and ample facility and space to carry out the

test execution. Customers at the NRTF continually request to test in more areas of the frequency spectrum to assess the effects of 5th generation technology. Given the added commercial use of similar frequencies, it is increasingly difficult to obtain uncontaminated radar cross section measurements due to the addition of new interference sources (e.g., radio/TV/cell towers). Currently the Air Force maintains a roughly \$1.5 million per year program to enhance the efficiency of this testing and maintain its accuracy. Future investments will continue to be needed to improve and modernize the NRTF to keep up with changing mandates in frequency management and environmental constraints.

ACTION: Foreign investment to acquire U.S. business that operate on land around DoD test and training ranges is another form of compatible land use that presents very unique challenges to range enhancement plans. The Air Force is active in the Council on Foreign Investment in the United States (CFIUS) process to evaluate the security risks of foreign investment in projects near test and training ranges. While there are inherent limitations with CFIUS in terms of scope and coverage, the process provides an opportunity for the Services to assess and mitigate potential impacts for covered transactions. It should be noted that the Service's review of the potential security implications of any foreign company investment can only be given in terms of risks (likelihood and consequence) to test and training activities. Actual impacts to test and training are not predictable.

Incorporating Space and Cyber Capabilities

ASSESSMENT: Full spectrum Air Force operations increasingly involve space and cyber capabilities; however, the ability to conduct integrated training does not match the increasing importance of space and cyber capability. Our operations rely on integrated air, space and cyber capabilities, therefore our training space must evolve to incorporate full spectrum training.

ACTION: The Air Force took a critical step in integrating capabilities in 2012 by moving responsibilities for the Space Test and Training Range to the Nevada Test and Training Range and Air Combat Command. This move facilitates the ability to integrate space operations into major, large-scale training exercises. As part of the overall investment in NTTR, the Air Force intends to invest in infrastructure which will allow space and cyber capabilities to seamlessly integrate into large-scale training exercises, such as Red Flag.

Specific test infrastructure enhancements were also completed that better incorporated space test capabilities. At Arnold Engineering Development Center, a \$2.6 million fiscal year 2012 (FY12) effort to install a military satellite communications (MILSATCOM) Atmospheric Scintillation Simulator (MASS) was completed to support the Advanced Extremely High Frequency Satellite (AEHF) multi-service operational test and evaluation as a test asset in FY14. The MASS imparts simulated atmospheric effects to satellite signals to evaluate communications performance under simulated operationally realistic atmosphere conditions. Holloman Air Force Base has begun an FY13 effort to acquire two additional jammers required to provide a threat-representative GPS jamming capability over a realistic test area. The \$1.6 million effort will support Joint Air-to-Surface Standoff Missile – Extended Range and Massive Ordinance Penetrator testing planned for FY14.

Institutionalizing Air Force Special Operations Forces Range Requirements

ASSESSMENT: Air Force test and training ranges have historically been used for the development of aircrews and airborne systems. Just as recent operations demonstrated an expanding role for space and cyber forces, they also highlighted the critical need to integrate special operations forces and battlefield Airmen. These forces, to include ground units, operate much differently than traditional air forces, but require the same access to realistic training space. Historically, these combat units have relied on an ad-hoc relationship with ranges to accomplish their training needs.

ACTION: The Air Force is currently working to better define and institutionalize the training space requirements for both special operations forces and battlefield Airmen. We have collaborated with the Special Operations Command (SOCOM) to transform Melrose Range into a premier special operations forces range and will continue to partner with SOCOM on future investments. Additionally, we are working with DoD and the Department of the Army to develop an interface between the Air Force's range scheduling system, Center Scheduling Enterprise (CSE), and the Army's Range Facility Management Support System (RFMSS) scheduling system to facilitate Joint training opportunities for ground and air units. Finally, to increase visibility on special operations forces (SOF) requirements, the Air Force has incorporated SOF range infrastructure requirements into the Air Force Test and Training Infrastructure Council process.

Reducing Range Congestion and Maximizing Capacity through Better Practices and Innovative Partnerships

ASSESSMENT: Congestion on Air Force ranges, especially within the MRTFB, has increased in recent years due in part to increased operations and the need for larger volumes of restricted airspace. In 2012, the Air Force mandated the use of Center Schedule Enterprise (CSE) as a common scheduling system across all ranges and airspace. This system enables range operators to more effectively and efficiently schedule training events in a given volume and time available, thus maximizing available range capacity. The system also allows aircrews from different units to review schedules across the enterprise, optimize training and coordinate synergistic training events when available.

ACTION: The Air Force is working with local communities and civil aviation organizations to optimize airspace use and move select, non-hazardous training off ranges. The highly successful Gulf Regional Airspace Strategic Initiative (GRASI) provides a mechanism to relieve air traffic congestion in northwest Florida while enabling test and training activity on the Eglin range. By addressing the requirements of all stakeholders, GRASI provided a more efficient use of existing airspace and ranges. This initiative illustrates the value collaborative partnerships bring to all stakeholders. The Air Force has partnered with the state of Florida to evaluate the feasibility of using portions of the Blackwater and Tate's Hell State Forests for non-hazardous DoD training. The Air Force is currently conducting the environmental

analysis for this proposal. Making the state land available for non-hazardous DoD training would expand the time available for hazardous operations on the Eglin Range.

The Air Force will also continue to support the Federal Aviation Administration as it integrates remotely piloted aircraft into the National Airspace System. As forces redeploy from the current conflicts, returning remotely piloted aircraft will train more frequently in domestic airspace. Allowing these aircraft to conduct non-hazardous operations outside of segregated airspace will open more range time for hazardous test and training missions which require range access, thus alleviating some congestion.

Additionally, we are working with DoD and the Department of the Army to develop an interface between the Air Force's range scheduling system, CSE and the Army's RFMSS scheduling system. Once complete, this interface will provide more efficient scheduling of range time.

ACTION: Improvements in test and training range efficiencies are also being advanced through enhancements to infrastructure. Modifications to the Gulf Test and Training Range Control Center and the Joint Gulf Range Area Network Development efforts are ongoing activities to ensure test and training data can be collected and processed for future generation aircraft and weapons. Upgrades include the ability to collect and process test and training data (including high definition video) at greater bandwidths needed by emerging warfighter approaches like NetCentric platforms and weapons. The data storage and sharing capability enhancements between MRTFBs provided by these efforts will also ensure timely data fidelity and integrity for procurement decision makers.

Future Investment

Despite previous Air Force investments to the air test and training range enterprise, the current Air Force infrastructure capabilities still require future attention to ensure they will be able to support the Nation's defense in 2025. Funding for Air Force MRTFB improvements and modernization is a recurring challenge. Our test and training capabilities must continually be evaluated so as not to fall behind the advancing technology of future planned weapons systems. The F-35 and Long Range Strike-Bomber programs, two core components of the Air Force 2023 strategy, represent emerging challenges to test and training. Additional investments in modeling and simulation, system integration labs, installed test system facilities and open air range capabilities support risk-reduction to these acquisition programs and the follow-on training that is required to maintain combat readiness.

Conclusion

The new defense strategy, the fielding of 5th generation aircraft, an increasing emphasis on space and cyber integration, and the possible benefit of institutionalizing special operations forces training - all in the context of an increasingly constrained fiscal environment - will drive future priorities and shape the range investment strategy for the Air Force. While addressing these priorities, the Air Force must remain cognizant of other national priorities, such as renewable energy goals and a national broadband infrastructure, while exploring

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cooperative land-use strategies to reduce congestion on stressed ranges. These challenges are immense, but not insurmountable. They are indicative of the constant need to balance readiness, sustainment, and investment. Innovative partnerships, established processes, better practices, and improvements in live, virtual, and constructive technology will enable the Air Force to meet test and training requirements while simultaneously supporting additional national priorities. Achievement of all these requirements and priorities necessitates continued aggressive efforts to find operational efficiencies within the test and training range enterprise, as well as reprioritization among broader defense goals.

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