The U.S. Air Force has embarked on a process of reshaping itself to better meet the demands of the new strategic environment. This new environment presents challenges that are quite different from those the service faced when it came of age during the Cold War. In that struggle, the adversary was well known, and the theaters of operation were identified and defended with permanently stationed forces. Today’s challenges are more diverse, and in many respects more unpredictable. There are both “pop-up” contingencies in places where the Air Force has rarely before operated and continuing “steady-state” regional security commitments far from any Air Force main operating base (MOB). This has forced a new mode of operation on the Air Force, one that has required frequent deployments of personnel and aircraft to austere forward operating locations. Not being structured to operate continuously in this way, the Air Force has had to pay a price for supporting these forward operations, a price that has been reflected in lower personnel retention rates and lower overall readiness. The service is responding to these challenges by reorganizing itself into an Expeditionary Aerospace Force (EAF). This reorganization represents an historic transition for the Air Force from a military service that has chiefly performed its mission by operating from MOBs to one that can quickly and easily project sizable forces overseas to austere and unanticipated locations, and sustain them there indefinitely.

To date, the Air Force has focused on the organizational aspects of this transition. It has designated ten Aerospace Expeditionary Forces (AEFs) that will rotate their availability for deployment and rapid response on a 15-month basis. This will allow the service to better
manage the burden of temporary overseas deployments, while providing the warfighting commanders-in-chief (CINCs) with forces tailored to their needs. The Air Force, however, must go beyond revising its organizational structure if it is to become a truly expeditionary force. By definition, expeditionary forces need locations overseas from which to operate. Consequently, it is of great importance to the success of the EAF concept that the Air Force formulates and pursues a strategy aimed at providing the global presence it needs to perform its mission. The research described in this report examines the requirements for such a strategy.1

FLEXBASING: A STRATEGY FOR GLOBAL AEROSPACE PRESENCE

The Air Force emerged from the Cold War with an overseas basing structure that was centered on the two operational theaters of greatest concern at the time—Western Europe and Northeast Asia. In 1981, there were 41 of these bases, and today only 13 remain. Unfortunately, as shown by Figure S.1, these remaining bases are not well aligned to support operations in unstable regions around the world today.

The situation amounts to an expanded security perimeter for the United States. The perimeter is not only expanded geographically, as shown in the figure, but also expanded with respect to the nature and timing of the threats. In the past, great powers have met the challenges of extended frontiers by devising strategies that relied on operational flexibility, rapid mobility, agile logistics, global awareness, and advanced communications. These strategic capabilities, which are needed to manage the security environment of the next century, correspond closely with the capabilities and core competencies of aerospace power. To bring these competencies to bear, the Air Force needs to formulate and advocate a strategy that enables the projection of combat power to operating locations within the regions of

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1 In this report, the term Expeditionary Aerospace Force, or EAF, will refer to the current efforts to transform the Air Force as an institution into an expeditionary military force. The term Aerospace Expeditionary Force, or AEF, will refer to each of the ten groupings of forces the Air Force is using to schedule eligibility for overseas deployment. Forces that deploy overseas from these AEFs will be referred to as “AEF force packages,” or sometimes as “expeditionary aerospace forces.”
instability. Such a strategy is as important to the Air Force becoming expeditionary as the organizational and doctrinal efforts that are already under way.

We call our suggested strategy “flexbasing” because we believe that expeditionary forces can effectively manage uncertainty with respect to overseas operating locations by developing and maintaining a high degree of operational and logistical flexibility. This strategy replaces efforts to achieve an elusive assured access to specific overseas operating sites with the development and maintenance of a robust capability to deploy to and operate from a range of locations with widely varying characteristics. These locations could be allied military bases, international airports, or abandoned airfields. They could be relatively distant from the combat area, requiring the use of long-range strike capabilities, or they could be quite close, posing force protection challenges. The strategy can be implemented by applying the operational, logistical, and space competencies of the Air Force in the following ways:
• Establish a global system of core support locations (CSLs), forward support locations (FSLs), and forward operating locations (FOLs). The CSLs (normally the home bases of EAF units) and regionally located FSLs will be situated to support the rapid deployment of expeditionary aerospace power into a large number of possible FOLs in a region. The FSLs will usually be simply storage sites, but they could also provide regional maintenance facilities for ongoing operations in a theater. FSLs will also provide en route infrastructure for air mobility forces and beddown sites for bombers and enabling assets.

• Develop and maintain a robust mix of both long- and short-range combat capabilities. Expeditionary operations should not emphasize one capability over the other, but maintain a flexible balance. They must have the capability to project combat power whether or not close-in bases are immediately available. In addition, long-range operations will often help to enable later access to locations closer to the action during a crisis.

• Develop space as an FSL supporting expeditionary operations. Low-earth orbit is a regional support location for expeditionary deployments that is situated only 200 miles from any theater of operations. In addition, Air Force space operations represent a relative strength for the United States, and provide almost assured access. The Air Force should seek to place as many enabling assets as it can in earth orbit. Among the missions that are being considered for accomplishment from space are the Airborne Warning and Control System (AWACS) and Joint Surveillance and Tracking System (JSTARS) functions. The feasibility of accomplishing the Suppression of enemy air defenses (SEAD) and antitheater ballistic missile missions from space should also be investigated.

• Advocate a global presence strategy such as flexbasing as a joint initiative. A global support infrastructure to enable expeditionary operations would not support only Air Force operations. All services will be able to use FSLs to regionally locate support equipment and supplies. The maintenance of the flexbasing system will need to be established as a specific goal of the shaping aspect of U.S. military strategy.
• **Design and establish a global logistics/mobility support system for the EAF concept.** This system, set up on a worldwide basis, will provide the combat support flexibility that expeditionary aerospace forces will need to deploy anywhere within a region, and then to rapidly commence and sustain operations. Our research addressed this key near-term enabler of a global presence strategy in detail.

• **Provide full-spectrum force protection to deployed expeditionary forces.** Force protection is a fundamental requirement for expeditionary aerospace forces. Just as expeditionary forces must have long-range capabilities to operate effectively from distant locations, they must also have the capability to operate from locations that are possibly very forward. Robust force protection will lower the likelihood that enemy threats could prevent expeditionary forces from deploying to an FOL. This is another key enabler of flexbasing.

The combination of these initiatives will enable expeditionary aerospace forces to deploy to widely varying locations. They will not be dependent on access to any particular base, and will have potential access to many locations throughout a theater of operations. Figure S.2 shows a notional example of the flexbasing concept—as a globally planned system to support the projection of aerospace power. Additional analysis to develop this concept is under way in a series of follow-on studies of logistics, mobility, and base access.

**A GLOBAL LOGISTICS/MOBILITY SUPPORT SYSTEM**

We addressed the last two aspects of the flexbasing strategy in greater detail. The first of these was to provide expeditionary forces with a high level of mobility and logistics flexibility through the design of a globally planned combat support system that closely integrates logistics and mobility capabilities. In observing the early deployments of AEF force packages, we concluded that with today’s support equipment and processes, the Air Force cannot achieve the very high levels of deployability it seeks for rapid-response deployments without prepositioning substantial amounts of infrastructure at the
expected FOLs.\textsuperscript{2} We also found that to have high confidence of gaining access to a prepositioned set, a number of these sets would need to be located throughout a given region, incurring additional support costs.

Our analysis indicated that positioning this infrastructure at FSLs and moving it to the FOLs with theater airlift represented a good compromise between cost and responsiveness. Generalizing this finding to support the goal of a worldwide EAF force projection capability led to the conceptualization of a global logistics/mobility support system with the following key elements:

\textsuperscript{2}The benchmark for rapid AEF force package deployability is usually expressed as a maximum of 48 hours from the time the deployment order is given to the generation of the first combat sortie at the FOL.
• **Forward operating locations** represent a potentially large number of deployment sites throughout a theater. They will have varying levels of prepositioned U.S. infrastructure depending on the level of U.S. interest and the quality of the relationship with the host country. We found that FOLs with the highest responsiveness will require the most in-place resources, and consequently will be substantially more expensive than FOLs with less responsiveness.

• **Forward support locations** are regional support facilities outside of CONUS, located at sites with high assurance of access. They will be joint facilities, normally staffed at low levels. They will also take maximum advantage of host nation funding and commercially available products and services. The resources stored at FSLs will vary with the defense requirements of the region, but could include munitions, spare parts, war reserve materiel (WRM), and humanitarian supplies. We concluded that FSLs will be essential to affordably supporting rapid deployments within a region, as well as for sustaining the deployed forces. We also found that in many cases FSLs will be the best option for conducting intermediate-level maintenance on engines and avionics components. By centralizing these functions at FSLs and not deploying them forward with each AEF force package, we determined that substantial reductions in deployment footprint and maintenance manpower requirements could be achieved.

• **Core support location** facilities are usually CONUS and overseas MOBs that are the home bases for expeditionary forces. However, they could also be contractor facilities or military depots that provide various types of support to deployed forces, such as consolidated maintenance functions. In some cases, CSLs will serve as backups to the FSLs.

• **An air mobility network.** The transportation network will support the peacetime and crisis movement of equipment and personnel between the FOLs, FSLs, and CSLs. The air mobility system will enable the periodic deployments and redeployments of forward-based AEF force packages. In addition, it will support the upkeep and surveillance of the infrastructure placed throughout the flexbasing system and exercise the routes used for assured resupply during wartime.
A logistics command and control (C2) system to facilitate decisionmaking and the flow of requirements information. Logistics C2 will also enable the system to react swiftly to rapidly changing circumstances.

The entire structure will need to be supported by a dynamic strategic planning process. This process must be informed by an analysis capability that can address issues such as what to preposition and where, the functions that should be performed at FSLs, and how many of each type of FOL should be set up. Decisions such as these must be made centrally for the entire system, so that mutual support between theaters can be leveraged and global transportation networks established. Centralized planning will be essential if the support system is to be affordable and sustainable over time.

FORCE PROTECTION FOR EXPEDITIONARY AEROSPACE FORCES

Although a highly capable logistics and mobility system will provide great flexibility of basing options, enemy threats could intervene to prevent AEF force packages from exploiting those options. FOLs with substantial levels of prepositioned materiel could have those resources denied to deploying expeditionary forces by credible enemy threats. Force protection is clearly partnered with logistics and mobility capabilities in enabling the flexbasing strategy. Together, the Air Force can deploy forces to wherever they are needed.

We examined a range of ground, air, chemical/biological, and information warfare threats to AEF force packages deployed at FOLs, at varying levels of intensity. Our purpose was to identify where the EAF concept needs to place its emphasis to achieve a deployment capability that is less constrained by concerns over the security of its forward bases. We identified four broad areas that need attention if expeditionary aerospace forces are to have the force protection capability they need.

Better Sensors and Firepower

Attacks on forward deployment locations could afford adversaries their best option for countering U.S. aerospace power. Security
forces at forward bases need new sensors and weapons to protect deployed forces from a range of ground, air, and chemical attacks. For example, the standoff threat to forward bases from mortars or rockets launched from outside of the base perimeter is a serious one. To counter this threat, a tactical unmanned air vehicle (UAV) with an infrared sensor is needed. Additionally, counterbattery and countersniper technology should be fielded. Better sensors are also needed to detect and evaluate air traffic in the vicinity of the FOL, and for detecting chemical and biological contaminants in food and water.

**Antitheatr Ballistic Missile and Cruise Missile Capability**

Today, the missiles fielded by most potential adversaries have poor accuracy and consequently little military value. Within the next decade, however, expeditionary forces will face theater ballistic missiles (TBMs) with substantially improved accuracy. In addition, the use of Global Positioning System (GPS) guidance systems and low observable technology will in all likelihood increase the threat of cruise missiles. Unless countermeasures are fielded, these weapons will circumscribe the range of possible FOLs available. As a result, the Air Force may be forced to rely solely on long-range weapon systems, which would reduce its operational flexibility. The Patriot PAC-3 system will have an improved capability against both TBMs and cruise missiles, as will a number of follow-on systems. However, none of these systems is highly deployable. There is no easy counter to these threats that meets the needs of expeditionary aerospace forces. Until an effective and deployable system is available, the Air Force must manage the risk with a combination of deterrence, prepositioning of defensive systems, and lengthening of employment timelines to include the deployment of defenses.

**Collective Protection Against Chemical/Biological (CB) Weapons**

Like TBMs, CB weapons have the potential to greatly reduce the deployment flexibility of expeditionary aerospace forces. Although great progress has been made in enabling deployed forces to operate in limited CB environments, ultimately expeditionary forces will face adversaries with sophisticated military CB capabilities. To prepare for this threat, the Air Force needs to procure a deployable collective
protection (COLPRO) capability. COLPROs could allow base operability while decontamination takes place. Without COLPROs, the only option for deployed expeditionary forces after a large CB attack would be to evacuate the base, leaving behind contaminated support equipment and shelters.

**Evaluate the Threats to Reachback Capabilities**

Expeditionary aerospace forces can significantly reduce their support footprint and enhance their effectiveness through communications “reachback” to rear areas for many command and control, intelligence, and planning functions. Smaller rapidly deploying and employing forces will especially need to leverage reachback for force protection and force enhancement. Denial of these capabilities through the use of communications jamming or information warfare (IW) attacks has the potential to substantially reduce the effectiveness of deployed forces. Although the degree to which this is a threat today is unknown, it is certain that it will increase in the future. The Air Force needs to evaluate the threat to its information flows and design appropriate measures to protect them.

**FLEXBASING AND OPERATIONAL EFFECTIVENESS**

We examined the effects of logistics support, force protection, and the flexbasing strategy on the generation of operational capability at forward locations by considering three cases involving the deployment of expeditionary packages of airpower.\(^3\) The first, Case A, posited deployment to a well-stocked forward base under the threat of TBM and CB agents. Case B looked at a deployment to a bare base with a similar high-intensity threat. Case C was a deployment to a moderately equipped base with a low threat. For each case, we considered the effect on operations of a regional forward support location at which to base sustaining supplies, bombers, and enabling assets such as tankers and AWACS. The measure of merit was the number of Joint Direct Attack Munitions (JDAMs) that could be

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\(^3\)Deployment of 12 F-15Es, 12 F-16CGs, 12 F-16CJs, and 6 B-1s was assumed. B-2s were employed directly from CONUS.
delivered over a two-week period. The results are shown below in Figure S.3.

As would be expected, an additional base in the theater resulted in more JDAMs being delivered in each case. Moreover, the FSL contributes substantially to the early application of force. In Case A, with a well-equipped base, only 168 JDAMs could be delivered in the first five days without access to an FSL, as opposed to 585 with an FSL. Case B indicates that FSLs contribute the most to operations in theaters without built-up FOLs. In this deployment to a bare base...
without an FSL, 96 JDAMs were delivered during the first five days.
With an FSL, 561 could be delivered. In this case, the results
represent the difference between pin-prick strikes and an air
campaign. In every case, the intensity of the strikes, as represented
by the slopes of the lines, was significantly greater with access to an
FSL. We found that the FSLs envisioned in the flexbasing strategy
could make important contributions to the quick response and
operational intensity of expeditionary packages of airpower.

**EVOLVING TO AN EXPEDITIONARY AEROSPACE FORCE**

As the needs of today’s strategic environment have become more
apparent, the concept of expeditionary aerospace operations has
gained strength and momentum. The work to date on the EAF con-
cept has of necessity focused on the organizational aspects of im-
plementation and on accommodating the current continuing de-
mands for forward-deployed forces. However, an expeditionary
force must be a rapidly deployable force, not just a rotational force.
To achieve this, AEF force packages must have small initial support
footprints as well as a large measure of operational and logistical
flexibility. One way of achieving such flexibility is the flexbasing
strategy that we describe in this report. Such initiatives are a way to
keep the process of evolving to a truly expeditionary force moving
forward.