It has been said that Great Britain conquered its earth-girdling empire at least in part to provide coaling stations to support the Royal Navy's global mastery of the high seas. The United States in the 21st century will similarly require robust and flexible basing and access for its wide-ranging aerial fleets. With imperial conquest out of fashion, however some other strategy must be devised to ensure that the U.S. Air Force (USAF) and its sister services have access to the bases and facilities they need for rapid and effective operations.1

The USAF has undertaken a number of initiatives aimed at improving its responsiveness and effectiveness in fast-moving, quickly evolving contingencies. Whether confronting a humanitarian crisis in Africa, sustaining a peacekeeping operation in Southwest Asia (SWA), or fighting a major war in Korea, the USAF has sought to increase its contributions to deterrence, crisis response, and war fighting when called on to respond to challenges to U.S. interests.

To accomplish this goal, the Air Force has instituted significant changes in its organization, operations, doctrine, and planning.

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1The word "access" can have multiple meanings. In current USAF vernacular, it is often used to denote not merely the basing or overflight rights needed to support operations but also the ability to gain dominance over adversary threats and thereby achieve some degree of tactical freedom—gaining "access" to the battlespace, as it were. In this usage, the "access issue" can include such elements as defeating an opponent's air-to-air and surface-to-air capabilities. This report takes the narrower view of the topic, addressing access in terms of threats—political and operational—to USAF basing for future contingencies.

For perspectives on the broader access issue, see Hawley et al. (2000); Wolfe (2001); Fulghum (2001); and Tirpak (2001).
Having reconstituted itself as an “Expeditionary Aerospace Force,” or EAF, the USAF is now in the process of changing many aspects of how it does business. This report is intended to contribute to this process by helping the Air Force think through one critical aspect of its future: access for basing.

THE EXPEDITIONARY IMPERATIVE

For most of its history, the USAF has relied heavily on forward basing, maintaining a substantial portion of its “tactical” force structure at overseas bases from which they would fight in the event of a war. This was an appropriate strategy during the Cold War, when U.S. defense planning focused on deterring or defeating a Warsaw Pact attack on Western Europe. Even in the late 1970s and early 1980s, when concern over Western energy security brought the Persian Gulf into focus as a new area of critical concern, worries centered on a Soviet attack into Iran as a prelude to the “real” war, which would be fought on the plains of Europe. USAF fighter squadrons were spread across the map of NATO, with wings and squadrons based at various times in France, Iceland, Italy, the Netherlands, Spain, Turkey, the UK, and West Germany. In the Pacific, Air Force units were located on Guam and in Japan, the Philippines, and South Korea.

With the 1990s came the Warsaw Pact’s implosion and the collapse of the USSR, removing the impetus for a massive U.S. presence in Europe. Bases closed and units came home, many to be disestablished as the USAF force structure drew down. By and large, the remaining forces were centrally based in the United States, deploying to available overseas bases only if circumstances so required.

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2“Tactical” here means those forces that are not primarily or exclusively committed to the nuclear retaliatory mission, performed until the early 1990s by the USAF’s Strategic Air Command (SAC). It is worth noting that until the parallel deployment of the B-52 and KC-135 tanker in the mid-to-late 1950s, SAC, too, depended on overseas basing for its mainstay force of B-47 medium bombers.

3Despite the technical inaccuracy of the practice, this report will use “overseas” as a synonym for “outside the territory of the 50 United States.”

4The differences in the posture of the USAF’s tactical forces before and after the Cold War are difficult to overstate. In 1982, 30 USAF fighter and tactical reconnaissance squadrons were permanently based at four locations in the UK, one in Spain, one in the Netherlands, and five in West Germany. In late 1999, only nine squadrons re-
In the midst of this evolution, Iraq invaded Kuwait and Operation Desert Shield was launched in response to that aggression. Although the United States had no permanent main operating bases (MOBs) on the Arabian peninsula, it benefited from Saddam Hussein's decision to sit tight after overrunning Kuwait. Thus, nothing interfered with the five-month-long buildup of Coalition forces in Saudi Arabia and elsewhere in the region, a buildup that was greatly facilitated by the wealth of bases and infrastructure available on the Arabian peninsula as well as years of prior cooperation between the United States and regional militaries. Indeed, by the time Desert Storm began on January 17, 1991, most USAF units were flying from bases that, in terms of logistics and operational support, were nearly as well endowed as full-fledged MOBs. Only after the hugely successful Gulf War did cracks begin to show in the USAF's planned post–Cold War posture. Two main factors contributed to the stresses that made themselves felt at this time.

First, while U.S. forces remained in the Gulf region to help enforce various UN resolutions binding Iraq, U.S. partners in the region remained reluctant to permit the United States to establish permanent bases on their territory. Saudi Arabia, the possessor of the area’s most extensive and robust base infrastructure, proved particularly shy in this regard. As a result of this lack of cooperation on the parts of key friends and allies, the USAF has been forced to rely on a series of temporary deployments to carry out its part in Operations Northern and Southern Watch. By the mid to late 1990s, these seemingly interminable activities were taking their toll on readiness—costs that have been further exacerbated by a steady stream of additional overseas commitments, the second necrotic element.

Indeed, life after the “end of history” has proven to be quite busy for the USAF. While operations above Iraq constituted a steady drain on Air Force resources, other contingencies—such as famine relief in Somalia, peace enforcement in Bosnia, and something approaching an air-only major theater war (MTW) over Kosovo and Serbia—imposed surge demands that have at times stressed USAF resources to the limit. Since late 2001, the USAF has also undertaken Operations

mained home-based in Europe, at Lakenheath in Britain, Aviano in Italy, and Spangdahlem in Germany.
Noble Eagle and Enduring Freedom, adding dramatically to the drain on USAF resources.\textsuperscript{5}

To cope with these pressures, the Air Force leadership decided that major changes were needed in the service’s organization and the focus of the USAF was therefore shifted from reliance on forward-based forces to rapidly responding to dynamic situations. Thus was born the idea of an air (later “aerospace”) expeditionary force (AEF)—a task-organized unit that could quickly deploy to a trouble spot and begin sustained operations within 48 hours of being ordered out of garrison.\textsuperscript{6}

As the AEF concept was articulated and elaborated, it became clear that this concept might also hold the key to addressing the USAF’s ongoing dilemma with sustained temporary duty (TDY) deployments. Building from the idea of the AEF, the Air Force reconceptualized itself as an EAF. At the heart of the EAF concept are ten permanent AEFs, each having some 134 aircraft available from designated squadrons, groups, and wings, which rotate through a 15-month schedule during which each AEF has a 90-day period of susceptibility for overseas deployment.\textsuperscript{7} The USAF hopes that by providing some predictability to the prospect of TDY deployments, the EAF structure will mitigate the stress on service members and facilitate smoother responses to the “steady state” demands on its forces.\textsuperscript{8}

\textsuperscript{5}Noble Eagle is the homeland air defense operation begun in the aftermath of the September 11 terrorist attacks; Enduring Freedom is the military operation against the Al Qaeda terrorist organization and the former Taliban regime in Afghanistan.

\textsuperscript{6}Current USAF Chief of Staff General John Jumper is usually regarded as the author of the AEF concept, which was developed when he was commander of the U.S. Ninth Air Force responsible for USAF operations in the Gulf. The 48-hour timeline may prove extremely challenging in situations where forces are deploying with little notice to an area that is not rich with prepositioned stockpiles of equipment and munitions. See Galway et al. (1999).

\textsuperscript{7}These AEFs, which are organizational constructs, are different from the “AEFs” that began carrying out short-term deployments to SWA in the mid-1990s; this is one example of how the terminology surrounding the AEF/EAF has not always been as clear as could be hoped.

\textsuperscript{8}The AEF is primarily a force management tool designed to help regularize the demands on USAF personnel to support day-to-day requirements for rotational presence overseas. Hence, its deployment rotations resemble the deployment schedule the Navy maintains for its fleet of flattops. And, just as carrier battle groups (CVBGs) can be unexpectedly called from port or out of workups to respond to an emerging crisis—with concomitant disruption to the orderly cycle of CVBG activity—so can USAF units
The AEF and EAF have thus emerged as a response to the tension between a post–Cold War reduction in permanent forward-basing opportunities and a rising demand for short-term foreign operations. The same tension has raised questions of access and basing to a new level of visibility. If the Air Force is not based on foreign soil but is still expected to operate overseas with little notice, it needs a strategy that will maximize its chances of gaining adequate access to perform its missions effectively and safely. This report attempts to shed some light on the nature and specifics of one possible approach to this problem.

The work reported here builds on a body of prior RAND research aimed at enabling effective USAF expeditionary operations. Although our problem is defined differently and our approach is our own, it should not be surprising if some of our conclusions echo those of the earlier efforts. In particular, we owe an intellectual debt to the team led by Paul Killingsworth, whose two-year study of AEF operations served as a foundation for our work. As will be seen, our analysis reinforces virtually all of that team’s key conclusions, especially their emphasis on the need for flexible planning frameworks and basing arrangements.

THE CHALLENGE OF ACCESS

Many important components of U.S. power projection capabilities—such as land-based fighters and Army divisions—are highly reliant on access to overseas installations, foreign territory, and foreign airspace. The Army has no role other than homeland defense if its forces do not venture outside U.S. borders, and the Marine Corps’ whole raison d’être is the conduct of expeditionary operations “from the halls of Montezuma to the shores of Tripoli.” Even the Navy’s carrier battle groups, free of the need for foreign bases per se, still require access to foreign ports and facilities for resupply and other support functions.

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9Their work is documented in Killingsworth et al. (2000).
Access and basing issues are also of great salience to the USAF. Like the Army, the USAF’s forces are for the most part equipped and configured to fight from “in theater,” as evidenced by the fact that fighters and attack aircraft such as the A-10, F-15, F-16, and F-117 have unrefueled combat radii of 300–500 nm. And while such ranges can be greatly extended through aerial refueling, these aircraft cannot be used to best advantage when they are based thousands of miles from their intended targets. Moreover, Air Force operations have experienced real difficulties because of access problems, most recently during a series of post–Desert Storm crises in the Gulf from 1996 to 1998.

In September 1996, Iraq perpetrated a gross violation of the terms of the Gulf War cease-fire, launching a ground attack against Kurds in and around the northern Iraqi town of Irbil. The United States wanted to engage the attacking Iraqi forces using aircraft based in Turkey and Saudi Arabia—aircraft already flying missions over Iraq enforcing the northern and southern no-fly zones. However, both Ankara and Riyadh denied the United States the use of these aircraft for combat missions against the Iraqi troops. In addition, Jordan denied the United States the use of its airspace despite the fact that a USAF air expeditionary task force (AETF) had recently been deployed there. Deprived of the use of its land-based airpower, the United States launched cruise missile strikes against air defense and command-and-control (C2) facilities in southern Iraq. These attacks had no obvious impact on the Iraqi army’s operations against the Kurds and must generally be assessed as a failure.

Similar events have been repeated since that time:

- In November 1997, Iraq expelled six U.S. members of the United Nations Special Commission (UNSCOM) weapon inspection team. In response, the United States sent additional aircraft to the region and increased aerial reconnaissance over Iraq. Saudi

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10Chapter Three analyzes the reasonable limits of extended-range operations for most current USAF fighters and attack aircraft. It is also worth noting that the next planned generation of USAF tactical aircraft, the F-22 and the F-35 Joint Strike Fighter (JSF), do not feature increased range among the advantages they will have over existing platforms.

11The following discussion draws heavily on unpublished work by James C. Wendt.
Arabia denied the United States permission to launch attacks from its bases and did not allow any additional forces into the country. Turkey was not asked for permission to conduct strikes from its territory but made it clear that if asked, it would refuse.

• Just two months later, the unresolved crisis flared again when Saddam Hussein blocked weapon inspectors from inspecting presidential palaces and other “sensitive sites.” Under the weight of extraordinary U.S. arm-twisting, Kuwait and Bahrain gave assurances of cooperation in military operations.\(^{12}\) Even under pressure, Saudi Arabia declined to support strikes on Iraq; Riyadh not only denied the use of U.S. aircraft based in Saudi Arabia but would not allow those aircraft to be moved to neighboring countries to conduct attacks from there. Faced with such unequivocal Saudi opposition, first Bahrain and then Kuwait backed away from their initial support of the United States. Qatar and the United Arab Emirates (UAE) also refused to allow the use of their territory, and Jordan, Turkey, and Egypt expressed opposition to any U.S. air strikes.

• Another incident occurred in November 1998, when Iraq announced an end to cooperation with UNSCOM inspectors. Although many Arab governments were markedly more critical of Iraqi actions than was previously the case, such governments remained unsupportive of U.S. military action against Baghdad. Most prominently, Saudi Arabia again refused the United States access to its facilities for offensive operations.

The USAF has also seen its activities impeded rather than stopped outright by access difficulties. Three examples illustrate this.

In 1973, President Nixon ordered an emergency airlift to resupply Israel, which had been attacked on two fronts by Arab armies and was fighting for its life. Operation Nickel Grass, as the airlift was named, was severely hampered by a lack of cooperation from America’s European allies, which refused to permit USAF airlifters to transit their airspace or use their facilities while en route to or from Israel. Heavy pressure from the Nixon administration finally per-

\(^{12}\)First, Secretary of State Madeleine Albright visited the region, followed closely by Secretary of Defense William Cohen.
suaded Portugal in essence to look the other way while U.S. C-5s and C-141s landed at and took off from Lajes airfield in the Azores. Absent this grudging assistance, the airlift—which Egypt’s president Anwar Sadat later cited as one of the pivotal elements in his decision to request a cease-fire—would almost certainly have been impossible.13

Almost 13 years later, lack of support from NATO allies again complicated a U.S. military operation. In April 1986, President Reagan ordered air attacks on a number of targets in Libya in retaliation for alleged terrorist activities. Operation El Dorado Canyon was complex enough to begin with, involving as it did F-111 and EF-111 aircraft flying from Great Britain and U.S. Navy jets operating from two carriers in the Mediterranean Sea. These problems were multiplied, however when both Spain and France refused to allow the F-111s to fly over their territory during the mission. This resulted in a substantial lengthening of the flying times for the F-111s, which had to start the trip to their targets in the southeast first by flying southwest over international waters opposite the French and Spanish coastline and then by slipping through Gibraltar and across the Mediterranean (see Figure 1.1). Having followed this tortuous course on their inbound journey, the crews were then expected to avoid strong Libyan air defenses, deliver their weapons (subject to extremely stringent rules of engagement), and turn around and make their way back the way they came.

This prolonged trip necessarily took a toll on both men and machines. By the time the F-111s made it to Libya, numerous aircraft had had difficulties with their sensitive targeting systems that either prevented them from dropping the bombs they had carried such a distance or resulted in the delivery of the weapons well off target. Tired aircrew also made errors that resulted in improperly aimed ordnance. Thus, while on a strategic level the attack can arguably be

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13In 1973, the USAF’s fleet of C-141A transport aircraft was not fitted for aerial refueling and could not have flown nonstop from the U.S. East Coast to Israel. The C-5A, which was equipped for refueling but was prohibited from doing so because of difficulties with its wing structure, could have made the trip on one tank of gas, but its maximum payload would have been reduced to 33 tons. By stopping at Lajes, the C-5s were instead able to carry an average of 68 tons per sortie. See Lund (1990), and Comptroller General (1975), pp. 10, 30.
assessed as a success, tactically the strikes achieved significantly less than planners had hoped. At least some of the blame for the disappointing performance must be assigned to the excruciating mission profile, which stressed aircrew and aircraft well past the bounds of their normal operations.

Finally, in December 1998 UNSCOM reported that Iraq had not complied with UN demands that Baghdad dismantle its programs for developing and producing weapons of mass destruction (WMD). Acting to carry out earlier threats, U.S. and British air forces attacked Iraqi military forces, installations, and facilities suspected of being related to WMD. The United States was able to use bases in Kuwait and Oman to launch some strikes. However, both Saudi Arabia and Turkey—where the United States had its largest concentrations of
deployed assets—denied the use of their bases. Operation Desert Fox, as the campaign was known as, was consequently executed predominantly by cruise missiles and carrier-based aircraft.\textsuperscript{14}

The past thus contains numerous examples of USAF operations that have been adversely affected by difficulties with access. In some cases, these problems sufficed to stop things dead in their tracks; on other occasions, workarounds of various kinds were ultimately devised. What sorts of challenges might the future hold? Three points seem worth making to help frame the problem.

First, despite many predictions that the nation-state will become increasingly irrelevant in the globally wired world of the new century, we see no evidence that governments are losing control of their physical territory.\textsuperscript{15} Although “cybercash” may flow unregulated across borders and refugees may make national boundaries seem porous and fluid, organized military forces will continue to require physical bases of operation, and their uninvited presence in a country’s territory will retain its traditional significance. Similarly, while some aspects of sovereignty may well wither away, we expect that the ability to control access to bases and airspace will not be among those factors that diminish in importance. As it has been in the past, so in the future the idea of “assured access”—the guaranteed ability for the United States to do what it wants when it wants, where it wants, from and via foreign territory—will remain a chimera. Except in the most extraordinary circumstances, nations simply do not cede so much control over such fundamental things.\textsuperscript{16} After all, having at

\textsuperscript{14}Access difficulties have continued to be bothersome. During NATO’s Operation Allied Force air campaign against Serbia, alliance member France reportedly refused to allow armed bombers flying from Fairford in the UK to overfly its territory enroute to their Balkan targets. Fulghum and Wall (2001).

\textsuperscript{15}There are multiple examples of failed or weak states such as Somalia whose central control of their territory is uncertain at best. However, even in these cases, someone—a local warlord, perhaps, or rebel faction—exerts de facto authority over the real estate in question, and U.S. military operations in, from, or above that territory must take the desires of the controlling authority, legitimate or not, into account.

\textsuperscript{16}The United States gained extraterritorial control over the Canal Zone in Panama by dint of good old-fashioned imperialism: physically occupying the real estate and refusing to give it back. A 1966 bilateral treaty gave the United States access for defense purposes to the British Indian Ocean Territories, including Diego Garcia, over which fly both U.S. and British flags.
least some control over acts of war committed from one’s territory must be considered one of the defining qualities of a government.

Second, many of the contingencies that crop up in the next decade or two are likely to occur in areas where the United States faces sizable access uncertainties. Europe—where the United States enjoys a history of close security relationships, an enduring alliance superstructure, and a plethora of potential basing options—may continue to witness limited conflicts on its southern and eastern fringes. However, the probable foci for large-scale warfare lie in regions of problematic access: Southwest Asia, the Taiwan Strait and South China Sea, and South Asia all loom large as possible hot spots. Africa, too, may be staring down the barrel of a series of humanitarian crises that will make past horrors pale in comparison as AIDS, ethnic rivalry, and still-exploding populations create seismic pressures that weak or corrupt governments will be unable to contain. Massive humanitarian intervention or peace operations in sub-Saharan Africa could present U.S. planners with particularly serious access problems.

Finally, evolving threats may induce planners to reassess the calculus of access. Historically, the USAF has preferred to deploy its fighter forces to locations lying within easy reach of their intended operational areas, generally within a few hundred miles. There are, of course, good reasons for this preference: shorter missions mean higher sortie rates and maximum efficiency from a force of a given size. If adversaries have the capability to credibly threaten the security of these close-in bases using surface-to-surface missiles, Special Forces, or other means, future theater commanders may face difficult tradeoffs between bedding forces down either optimally or securely. Under circumstances such as those depicted in Figure 1.2—a conflict with an Iran equipped with a number of Nodong-class

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17 The emergence of Central Asia as an unexpected theater of operations in late 2001 is evidence of the unpredictability of future requirements.

18 See Chapter Four for an in-depth discussion of how basing and access issues might play out in a complex military operation other than war.

19 Effective defenses against one or more of these various threats may be feasible in the future; to the extent that they are, these problems could be mitigated somewhat. The authors, however, are convinced that no plausible near- to midterm defenses will be so robust as to eliminate this risk-versus-efficiency calculus. This factor, combined
700-nm-range missiles, potentially carrying WMD warheads—the USAF may want or need to fight from distant bases to improve prospects for force protection. Plans and platforms must therefore be able to operate effectively under such suboptimal conditions.

with the ever-present risk of access denial by foreign governments, demands that the USAF develop the requisite operational flexibility to cope with the possibility of operating from longer ranges.

The USAF has in the past operated from bases within the range of enemy ballistic missiles, notably during the 1991 Gulf War, and it could always choose to continue to
The Air Force thus faces a complicated set of demands as it confronts its future as an expeditionary force. It must plan, organize, equip, and train itself according to a new set of principles suited to a world that demands frequent, short-notice deployment and employment across a spectrum of conflicts that may occur virtually anywhere in the world. Moreover, it must do so in the face of grave uncertainties—driven by ineluctable political and military realities—with regard to where, how, and when it will be able to operate. The USAF therefore needs a global access and basing strategy that will help it prepare for tomorrow’s requirements. This report outlines an approach to such a strategy and recommends some specific components thereof.

**ORGANIZATION OF THIS REPORT**

The remainder of this report consists of five chapters.

- Chapter Two reviews the region-by-region history of USAF access, with emphasis on patterns and trends that can help inform thinking on future opportunities and constraints.
- In Chapter Three, we employ quantitative analysis to help identify options for improving USAF operational capabilities in situations where forces are compelled—by friendly politics or enemy action—to conduct combat operations from distant bases.
- Chapter Four describes the demands that could arise in a complex military operation other than war (MOOTW) using a challenging peace-enforcement and humanitarian mission in Central Africa as an example.
- Chapter Five outlines our recommendations for a USAF global access strategy that is built around the idea of portfolio management. It also contains some brief concluding remarks.