Chapter One

INTRODUCTION

After the Cold War, the United States found itself in a new security environment. Instead of facing known adversaries in a limited number of locations, the U.S. military has had to support numerous overseas deployments, many on short notice, with a wide range of capabilities. Deployments have been made for missions ranging from peacekeeping and humanitarian relief to major combat operations as represented by Operations Noble Anvil\(^1\) and Desert Storm. This pattern of varied and fast-breaking regional crises appears to be the model for the foreseeable future. The U.S. Air Force has been and is likely to continue to be heavily involved in a wide variety of such operations.

The new environment has put a substantial burden on the Air Force: when operations have required land-based airpower, these needs have been satisfied by deploying both personnel and equipment to remote locations. The combination of frequent and lengthy deployments has created professional and personal turbulence for Air Force personnel. This turbulence has been linked by some to recent decreases in both retention of personnel and readiness.

To ease the burden of such deployments, the Air Force has begun to reorganize into an Expeditionary Aerospace Force (EAF). The goal of this reorganization is to replace forward presence of airpower with a force that, in response to a crisis, can deploy quickly from the continental U.S. (CONUS), commence operations immediately on arrival,

\(^1\)Operation Noble Anvil was the name for the U.S. Air Force combat operations in Kosovo during the spring of 1999.
and sustain those operations as needed. To implement this vision, the Air Force will divide its forces into roughly ten Aerospace Expeditionary Forces (AEFs), each with a mix of fighters, bombers, and tankers, and will assign two of these to be “on-call” for crises for 90-day periods, leaving 12 months between on-call periods for each AEF. The reorganization is designed to improve deployment scheduling, balance deployment assignments among units, and reduce uncertainty associated with meeting deployment requirements.

Because the EAF concept centers on deploying combat forces from CONUS, early discussions concerning support resources focused on preparation of the deploying unit and paring unit resources to enable the deploying forces to be “light, lethal, and self-contained,” or at least self-sustaining for the first few days. However, most resources needed to initiate and sustain combat operations such as munitions, fuel, and War Reserve Materiel (WRM: portable shelters, ground support equipment, and vehicles) are not unit-level resources. These resources are heavy and are usually managed by the respective Numbered Air Forces that support specific Commanders in Chief (CINCs). Furthermore, most units’ resources’ weight and volume are associated with support equipment, e.g., lightalls, jammers, and bobtails. Our analysis of these resources, sketched below, leads us to conclude that with today’s support processes, policies, and technologies, deploying even a modest fighter-based combat force to a bare base will require several days of development before the Forward Operating Location (FOL) can sustain a high flying tempo. If the Air Force is to employ immediately, after deploying quickly, these resources must be prepositioned at the base or at regional facilities in quantities needed to support the employment scenario, and this network of Agile Combat Support (ACS) resources must be planned and reviewed to meet global strategic security requirements.

Further, the design and implementation of this network will require complex tradeoffs that will be based on a combination of empirical analysis of such resources as airlift capacity and support setup timeline combined with subjective analysis of factors such as political and military risk.

This report synthesizes recent RAND research to present a vision for the ACS and mobility system that is robust against a number of scenarios and to address options for meeting requirements for munitions, WRM, fuel, maintenance, and other support resource
requirements needed for potential and uncertain scenarios. We illustrate how support option characteristics change when employment scenarios, support technology, policies, and practices change. Our objective is to foster discussion about the future ACS and mobility system and about the methodology for rigorously designing and implementing the system. Developing such a vision is a complex undertaking requiring a formal integrated ACS and mobility planning process embedded in overall Air Force planning to continuously review ACS and mobility postures to meet defense needs as they evolve.

THE EAF CHALLENGE TO THE ACS/MOBILITY SYSTEM

In large part, the current ACS/mobility system, like the current combat force, was designed for the two major theater war (MTW) scenarios of the Cold War: large-scale conflicts in two well-defined locations (Europe and Korea) where air units deployed to bases with a fairly rich support infrastructure in place. Noble Anvil and Desert Storm largely fit this model because of the sophisticated infrastructure that was used by the U.S.-led coalition in Noble Anvil and because of the extensive time allowed for the coalition to enhance and extend the infrastructure in Desert Storm.

More typically in the current environment, the ACS/mobility system must support an expanded range of operations from MTWs to small-scale contingencies. These operations may take place in a variety of locations, vastly increasing planning uncertainty. This change in environment coupled with operational requirements for quick deployment, immediate employment, and indefinite sustainment means that the ACS and mobility systems need to be evaluated for possible modifications to cover the new range of operations. That evaluation has been the subject of ongoing RAND research on the EAF.

The ACS/mobility system must plan and operate on three timescales:\(^2\)

\(^2\)The Air Force, like the other services, uses the PPBES (Planning, Programming, Budgeting, and Execution System) to formally plan for, allocate, and expend money on resources. It also is developing and institutionalizing Air Force-specific processes for longer-range planning. We have intentionally not linked our timescales with these
• At the execution level (days to weeks) the ACS/mobility system must support ongoing operations with existing support resources and processes.

• At the strategic level (months to years) the system must acquire resources and develop processes to support evolutionary changes to the existing force structure across the full spectrum of operations in any location critical to U.S. interests, subject to peacetime cost constraints. In this time frame, alternative support practices, policies, and technologies can be developed to meet anticipated employment requirements.

• At the long-term level (decades) the ACS/mobility system and its strategic infrastructure must be modified to support new force structures as they come on line and may involve supporting vastly different weapon technologies.

To deal with meeting operational requirements in this changing environment, the Air Force has concentrated on the execution timescale. In contrast, our research has addressed decisions at the strategic level, which has included examining the cost and effectiveness of alternative ACS/mobility system options involving different practices, policies, and technologies across a broad range of contingencies.

ANALYTIC FRAMEWORK FOR STRATEGIC ACS/MOBILITY PLANNING

The core of our analytic framework for strategic ACS/mobility planning is a series of models of critical support processes such as munitions preparation, fuel support, maintenance, and the like that can calculate equipment, supplies, and personnel needed to meet operational requirements. Because support requirements are a direct function of mission requirements, the models are employment-
driven—that is, they start from the operational scenario with estimates of types and numbers of aircraft, sortie rates, types of weapons, and so forth. Once the support requirements are computed, the models can be used to evaluate options for satisfying those requirements—for example, prepositioning the equipment, deploying it from CONUS, or deploying it from regional support locations. The evaluation considers several dimensions, such as spin-up time (the time required for the deployed force to be ready to conduct operations from its deployed location), footprint (the amount of airlift capacity the deployment requires), peacetime costs (both investment and recurring), flexibility, and risks (both military and political). Figure 1.1 depicts the framework.

The primary advantage of employment-driven models is that they allow us to deal with the pervasive uncertainty of expeditionary operations. The models can be run for a variety of mission requirements selected by operators, including the support needed for different types of missions (humanitarian, evacuation, small-scale inter-

![Figure 1.1—Employment-Driven Analytical Framework](image-url)
diction, etc.), the effects of different weapon mixes for the same mission (new or light munitions), the effects of differing support policies, practices, and technologies, and other factors associated with supporting operations.

To use the support models in this manner, they must run quickly and estimate requirements at a level of detail appropriate for strategic decisions. This means the models must address the resources and processes that account for most of the footprint—the numbers of personnel and large pieces of equipment, such as fuel trucks, bomb loaders, cranes, and large maintenance test sets. At the same time, they must contain enough detail so that major changes to the process can be reflected in the model and evaluated in terms of their effects on different metrics. For example, one insight gained from our research is that the requirements for some support processes can be divided into Initial Operating Requirements (IOR)—the equipment, people, and supplies needed to begin operations, and Follow-On Operating Requirements (FOR)—items needed for sustainment. Being able to distinguish these in the model provides a more-flexible set of options for providing the necessary support.

The final step evaluates an option’s effects on the overall metrics, including the tradeoff among moving resources from CONUS, from regional Forward Support Locations (FSLs), or prepositioning them at the FOLs from which the aircraft will fly. Mobility requirements enter the process at this step. In general, tradeoffs must be made. For example, prepositioning equipment at FOLs can reduce the spin-up time and reduce airlift footprint, but at higher costs (to preposition duplicate sets of resources at different FOLs) and possibly greater risks, if access to the equipment is subject to political or military interference.