Our use of the analytic framework and prototype models for specific commodities has made clear the broad characteristics of the ACS/mobility system required to support expeditionary operations for the current force. The most important finding of our research is that the Air Force goal of deploying a nominal expeditionary package (a 36-ship mixed fighter squadron of air defense suppression, air superiority, and ground-attack aircraft) within 48 hours to an unprepared bare base cannot be met with today’s support processes. That timeline can be met only with judicious prepositioning, and even then only under optimistic assumptions.

Figure 3.1 shows the results of using a prototype integrating model for munitions, fuel, vehicles, and shelter for a ground-attack scenario using the above force package. The model recommended positioning at FOLs, FSLs, or CONUS for each commodity based on three target timelines, while minimizing peacetime cost. The 48-hour timeline requires substantial materiel prepositioned at the FOL. In contrast, a bare base could be used if (1) the timeline were extended to 144 hours and (2) the materiel were prepositioned at an FSL. Little support can be provided from CONUS even by accepting a longer timeline.1

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1These timelines assume that airlift is available for moving the aerospace force as needed. Other demands, such as moving Army units or humanitarian supplies could divert airlift resources in any given contingency at the discretion of the CINC and would increase the time required to close this force.
Deployment times and distances are based on Southwest Asia. FOLs are assumed to have adequate runway and ramp space. FMSE = Fuel Mobility Support Equipment.

SOURCE: MR-1075-AF.

Figure 3.1—Cost/Timeline Resource Allocation Tradeoff

These commodities are heavy and require substantial transportation to move them. The timeline and the strategic airlift working area constraints that we used in our analysis did not allow the material to arrive in time.2 Moving these commodities requires large numbers of vehicles and materials handling equipment such as forklifts, trailers, and other large vehicles. The current Harvest Falcon shelter package for bare bases requires 100 C-141 loads to move and almost four days to erect with a 150-man crew. Because so much airlift is needed to move the equipment, unloading space for airlift at the FOL becomes a key constraint on how fast the deployment can be executed.

2The Maximum On Ground (MOG) was set at two for FOLs. This may be reasonable for FOLs such as Al Jabbar Air Base in Kuwait, Azrac Air Base in Jordan, and Sheik Isa Air Base in Bahrain.
This does not mean that expeditionary operations are infeasible. Rather, it means that setting up a strategic infrastructure to perform such operations involves a series of complicated tradeoffs. Expensive 48-hour bases may best be reserved for areas of the world that are critical to U.S. interests and are under serious threat, such as in SWA or Korea. In other areas, a 144-hour response may be adequate; deployment to such areas could be supported from suitably chosen FSLs. In still other areas such as Central America, most operations are humanitarian relief missions, which could be accomplished with a 48-hour timeline to a bare base because much of the heavy equipment required for combat operations would be unnecessary. For all of these cases, the models and analytic framework can help decisionmakers negotiate the complex webs of strategic infrastructure decisions.

Note that FSLs appear in the solution set regardless of the FOL employment time. They provide a cost-effective method of providing forward storage of heavy commodities and maintenance of commodities that require large and heavy maintenance equipment repair. The Air Force already uses FSLs for munitions and WRM storage. The Buffalo Soldier, a munitions ship, is an example of an FSL afloat. Sanem Luxembourg is an FSL dedicated to WRM storage. Consolidated regional repair centers have also been established to support recent conflicts. During Desert Storm, C-130 engine intermediate maintenance was consolidated at Rhein Main Air Base for all C-130s participating in that operation. During Noble Anvil, intermediate avionics repair was established at RAF Lakenheath (UK) to support F-15s assigned to the operation.