

**WHITE PAPER**  
**AIR MOBILITY COMMAND**  
**GLOBAL EN ROUTE STRATEGY**

**EXECUTIVE SUMMARY:**

The current strategy for our en route system is based on the results of the 1995 Mobility Requirements Study-Bottom Up Review (MRS-BURU) with refinements by mobility capabilities studies in 2000 and 2005. The Global War On Terror has raised questions on the validity of the current mobility en route system's sizing and alignment. Furthermore, the evolution of air mobility aircraft, operations, and various stressors on the en route system indicate a need to reevaluate the capabilities required in the en route system.

The current National Security Strategy and National Defense Strategy provide the baseline for what our mobility strategy should be capable of achieving. The Nation's emphasis on global alliances, economies and responsibilities mandates global access and especially access to strategically important areas of interest. Therefore, the goal of the proposed AMC en route strategy is global access allowing the full spectrum of passenger and cargo movement.

The Areas of Interest, defined as continuing zones of hostility or instability or areas prone to natural disasters and having the greatest need for airlift support, are identified as Southwest Asia, Southeast Asia, Korea, Africa, Eurasia, and Indonesia. Accordingly, the en route lay-down and infrastructure must be able to support a heavier flow to these regions. In addition, the resulting strategy accounted for political sensitivities and was optimized for a presumed tight fiscal environment. Finally, while the existing strategy maximizes the operational capabilities of our mobility platforms, the new strategy must accommodate the limitations of services and support in those locations we could be asked to transit.

In this proposed strategy, unlike in previous en route strategies, we've factored in the family of tanker assets in our approach. While A/R assets have the ability to extend airlifter's range, this factor was not considered in the previous en route system strategy's structure, primarily because the system is designed to be responsive to worst-case scenarios, i.e., A/R assets not being available to refuel airlift assets.

The previous strategy was based on the "lens," or "sweet spot", for strategic airlift operations, describing physical and technological limitations of the strategic airlift fleet overlaid on the geographic landscape. The lens concept will be no less valid in 2025 than it was when it was first conceived; however, in the proposed strategy we will refine its utility. The new strategy does break from the historical view of a "location-centric" en route concept which promotes viewing the en route through its individual locations rather than as an interdependent system. This perspective could result in decision-making that fails to consider the effect on the entire strategy. For example, efforts to reroute airlift flow to certain locations in order to reduce fuel consumption fail to account for the impact on the entire en route system. Instead, the proposed strategy adopts a system of mutually supporting routes, allowing one to more readily see the en route as a system of interdependent capabilities rather than a loose collection of locations. The Atlantic and Pacific route systems are described below.

**The Atlantic Route Strategy:** We propose that there are three primary routes for supplying the warfighter—northern, central and southern. These Atlantic routes have the

advantage of providing overlap for each other. This feature of the Atlantic routes leads us to postulate an alternate name for the Atlantic strategy—“Three-Use-Two.” In other words, we have three routes across the Atlantic, and for any given action in one of the areas of interest, two of the routes are available for delivering supplies to those areas. Should one route become restricted or unavailable for whatever reason, political, meteorological, operating hours, saturation, etc., supplies can be diverted through the additional supporting route.

**The Pacific Route Strategy:** We acknowledge in the Pacific that there are two primary routes to supply the warfighter. We expand on the original “2-Lose-1” strategy by proposing a “Two Route Plus” option. The strategy still utilizes the Northern and Southern routes. However, overlap of the routes, as seen in the Atlantic Strategy, is less feasible due to the geography of the Pacific structure. Therefore, the “Plus” alludes to our refinement of the strategy and enhances the original “2-Lose-1” strategy by mitigating choke points that might hinder flow.

Next, in an effort to facilitate the flow through the route structure mentioned above, capabilities at each en route location must be identified. Maintenance and aerial port capabilities are combined into general definitions to capture the full spectrum of required logistics capabilities. These definitions are categorized into a four tier system. First, Tier I locations have both major maintenance capability and full hub/spoke distribution service aerial port capability (may include full break-bulk operations and robust passenger handling). Second, Tier II locations are capable of minor maintenance, minor passenger handling, and trans-load, break-bulk, flightline-to-truck dock “customer receipt” aerial port services. Next, Tier III locations have limited maintenance and limited aerial port services, to include passenger handling and upload/download capability only. Finally, Expeditionary locations are stood up by deployed personnel to provide limited maintenance, and aerial port capability, that can be sized as necessary to full distribution service capability or limited “customer receipt” capability. A table of proposed en route locations can be found at page 31 of the white paper.

It is important to note that these definitions are general in nature and only meant to provide a guideline for determining relative size. In fact, the maintenance and port capabilities at any given location may not neatly fall into corresponding tiers. For instance, locations like Aviano AB would be classified as a Tier III for maintenance, but a Tier II for port capabilities.

For a strategy to succeed, it must be implemented at the operational level, which implies occasional subordination of operational efficiencies to the greater strategic need and desired long-term effect. What we have learned over the years is that if locations aren’t used, they will be lost, either to budget cutting measures or to host nation designs. To secure access to locations required during contingencies or surges, we must be willing to operate in a distributed manner, even if this means a loss of day-to-day efficiency. Finally, the strategy cannot be static. It must adjust and adapt to changes in the National priorities, political landscape, and fiscal constraints. To that end, we recommend that every two years, the command undertake a comprehensive review of the en route strategy.

**WHITE PAPER**  
**ON**  
**GLOBAL EN ROUTE STRATEGY**

**1. BACKGROUND:**

The existing en route structure is rooted on bases held at the end of World War II. In both the Pacific and European theaters, infrastructure held at the end of the armistices form the backbone of our en route infrastructure nearly 70 years later. The modern strategy for our en route system is based on the results of the 1995 Mobility Requirements Study-Bottom Up Review (MRS-BURU). This study adopted the National Military Strategy of fighting and winning two simultaneous Major Theater Wars (MTWs) and proposed the mobility requirements necessary to support that strategy. In 1996, AMC and USAFE, as part of an ad hoc en route system working group, agreed that the requirements in MRS-BURU were valid and established a requirement for six bases with sufficient capacity to allow for the loss of any one base. Additionally, the agreement identified the need for two bases on the Iberian Peninsula, as well as in Germany and the United Kingdom. However, in the same year, Spain denied access to Torrejon AB and shortly thereafter, USAFE decided to end the Air Force presence at Zaragoza AB. In 1998, USTRANSCOM and USEUCOM formalized the en route system working group into what is known today as the European En Route Infrastructure Steering Committee (EERISC) charged with advocacy responsibilities for mobility infrastructure in USEUCOM's Area of Responsibility (AOR). The EERISC then formalized the European en route basing strategy, better known as the 6-lose-1 strategy.

In 1999, the Pacific En Route Infrastructure Steering Committee (PERISC) was stood up as a parallel effort with the EERISC and established what's become known as the 2-lose-1 strategy – basing along two primary routes with sufficient capacity to permit the temporary loss of one route without excessively delaying the delivery of forces along the other.

Subsequent mobility requirements studies in 2000 (Mobility Requirements Study – 2005 (MRS-05)) and 2005 (Mobility Capabilities Study (MCS)) refined the requirements of the earlier study but made no significant change to the en route system. MRS-05 became the justification for a large number of infrastructure improvement projects in both the Pacific and European theaters. As a note, the MCS stated that the overseas infrastructure, not the number of available aircraft, remains the fundamental constraint when attempting to reduce delivery timelines associated with large scale deployments.

In 2005, the National Military Strategy shifted from winning two simultaneous MTWs to the 1-4-2-1+ strategy—to defend the homeland, operate in and from four forward regions, win two overlapping campaigns, win decisively a single campaign and conduct a limited number of lesser contingencies. Additionally, the stand up of USAFRICOM in conjunction with the on-going Global War on Terror suggests that Africa could be viewed as a fifth “forward region” which will require significant mobility capability to support the intent of the National Military Strategy.

Today, the National Security Strategy (NSS) and National Defense Strategy (NDS) emphasize the global nature of our commitments and obligations. To that end, the NDS states

that “The United States requires freedom of action in the global commons and strategic access to important regions of the world to meet our national security needs.” (2008 National Defense Strategy, p.22) Consequently, an air mobility strategy must be capable of providing the Nation’s access to the strategically “important regions of the world.”

## **2. JUSTIFICATION FOR NEW STRATEGY:**

The evolution of air mobility and the following stressors on the en route system point to the need to reevaluate the capabilities required in the en route system:

- The National Military Strategy has shifted from a two MTW strategy to the 1-4-2-1+ strategy
- The events of 11 September 2001, resulting in the Global War on Terrorism (GWOT), have dramatically altered the way we employ our military’s capability in ways unforeseen in 1998
- Significant manpower reductions driven by Program Budget Decision (PBD) 720 will require USAF and AMC to identify efficiencies and process improvements in the en route system to best accomplish the mission within the reduced level of manpower
- The Air Force Smart Operations for the 21<sup>st</sup> Century (a process that re-engineers the USAF, by eliminating steps that add no value to the end product or by combining process steps to save time) has put intense scrutiny on the en route system as the Air Force looks at avenues to save money and increase velocity
- The military has become more expeditionary in nature stressing the mobility capabilities on a daily basis
- The other Services have modified their future systems acquisitions (e.g., the Army’s Stryker program) which potentially increase their airlift requirements
- The establishment of Africa Command (USAFRICOM), and its implications, were not included in the MRS-05 analysis; it will add a new combatant commander (CCDR), whose mobility requirements will compete with other regional CCDRs
- The airlift fleet is significantly different in composition than that assumed and proposed in MRS-05
- The next generation air refueling aircraft is programmed to have a cargo capability which may require an expansion of cargo handling capability at locations traditionally dedicated to aircraft that don’t routinely carry cargo (e.g., KC-135s) as well as may require larger parking areas than required for KC-135s. In addition, extensive fuel hydrant modifications may need to be examined to handle the new aircraft, as well as the requirements for airframe-specific maintenance personnel and supply stocks
- The en route system, as championed in MRS-05, is airlift centric, focusing on a quantifiable cargo handling capability (million-ton-miles), a metric that is not always applicable
  - Cargo and passenger generation, through-put and reception requires significantly greater infrastructure than gas-and-go operations as does workflow generated by strategic distribution—i.e., truck-to-truck flow, seaport-to-airport flow, and seaport-to-surface movement flow

- Did not explicitly deconflict the use of airlift ramps between AMC mobility assets and other MAJCOM or CCDR/Service apportioned assets (e.g., USAFE/ PACAF C-17s, tankers, fighters, USN aircraft, and/or USA aircraft)
- The increased range and payload capability from the C-5M, and the increased range capability of the extended range tank-equipped C-17s may extend the traditional concept of the en route system to include capabilities closer to the warfighter
- Creation, approval, and implementation by USTRANSCOM, USEUCOM, and USCENTCOM of the European Intermodal Distribution (EID) and Middle East Intermodal Distribution (MEID) CONOPs in the 2006-2007 timeframe
- Changing nature of the threat (including MANPADs) that requires Defensive Systems use, tactical approaches and arrivals, and transload operations
- Increase need for hot cargo pads to support deployment of Stryker units, FCS, and MEFF-V with munitions as an integral part of the load
- Advent of Just-In-Time Logistics concepts
- The evolving nature of the battlespace (from Cold War's linear, contiguous configuration to a non-linear, non-contiguous paradigm) that will likely be much more demanding of air mobility for deployment, supply, and redeployment

These factors point to the need to reevaluate the required capabilities in the mobility en route system.

The GWOT has raised questions on the validity of the current mobility en route system's sizing and alignment. Realignment of US forces out of Korea and Japan will force changes in OPLANS/CONPLANS, significantly expanding the role of Guam in the USPACOM AOR. Likewise, within the USEUCOM AOR, USAFE has explored budgetary cost reductions through base realignment, evaluated the range of the C-17/distances expected for a crew to transit, and directed manpower reductions as a result of PBD 720. Concurrently, an increased drive to improve velocity and precision, with decreased delivery times, has led to evaluating the current and future force structure within the AMC En Route System.

### **3. STRATEGY REQUIREMENTS**

A comprehensive study is needed to validate, modify, or recreate the mobility en route structure. A fresh look at the en route system would first require a definition of what the system encompasses (e.g. a shift from requirements driven modeling to capabilities based). The study should use USTRANSCOM's Distribution Process Owner (DPO) concept of factory to foxhole vice Aerial Port of Embarkation (APOE) to Aerial Port of Debarkation (APOD) as a guiding principle for looking at air mobility operations, focusing on the en route distribution portion. The intent of this statement is not to focus on tactical-level destinations or homestation/CONUS originating locations, but to ensure the inclusion of aerial ports that perform a substantial amount of onward air movement, even if they also often serve as originating/ terminating locations.

Any study of the en route system capabilities should define the level of risk imposed by fiscal realities, physical infrastructure, manpower, and supporting host unit services. It should attempt to minimize the impact of those risks by adjusting the strategy to compensate. Additionally, it should identify mechanisms and procedures to adjust the en route capability to meet supported OPLAN requirements. It should also consider organizational structure impacts on throughput capability.

Furthermore, the reevaluation of the en route system should be strategic in nature. The benchmark for whether a location would qualify as a strategic en route location should be based on whether OSD (Executive Agent of USAF) would be willing to commit military construction (MILCON) funds to, or seek Host Nation funding for, mobility infrastructure (MILCON programming, funding and execution responsibility often falls on other services per DODI 4000.19). The commitment of these funds would signal a long term commitment to the mobility mission at that location.

The final component of this study would initiate an established review of Cooperative Security Locations (CSLs) identified within the CCDR Master Basing Plan. Using the en route bases as the hubs, these CSLs would be the spokes that can be reached by each hub. More importantly, the CSLs help to bridge the coverage gaps that exist. The CSL's capabilities will impact the size and location of more robust and permanent en route locations.

Millions of dollars have been invested in the current en route structure to support the strategy laid out in MRS-05. The structure will likely remain intact; however, how the structure will be used is a key question this study will address. At a minimum, the study will evaluate the current en route system using the latest baseline information so it is responsive to changes in the strategic environment.

The resulting strategy should be adopted as the minimum acceptable capability, identify maximum allowable capability based on permanent infrastructure/equipment constraints, and provide the basis for fiscal support from owning and using MAJCOMs and applicable services (e.g., USN).

#### **4. STRATEGY LANDSCAPE:**

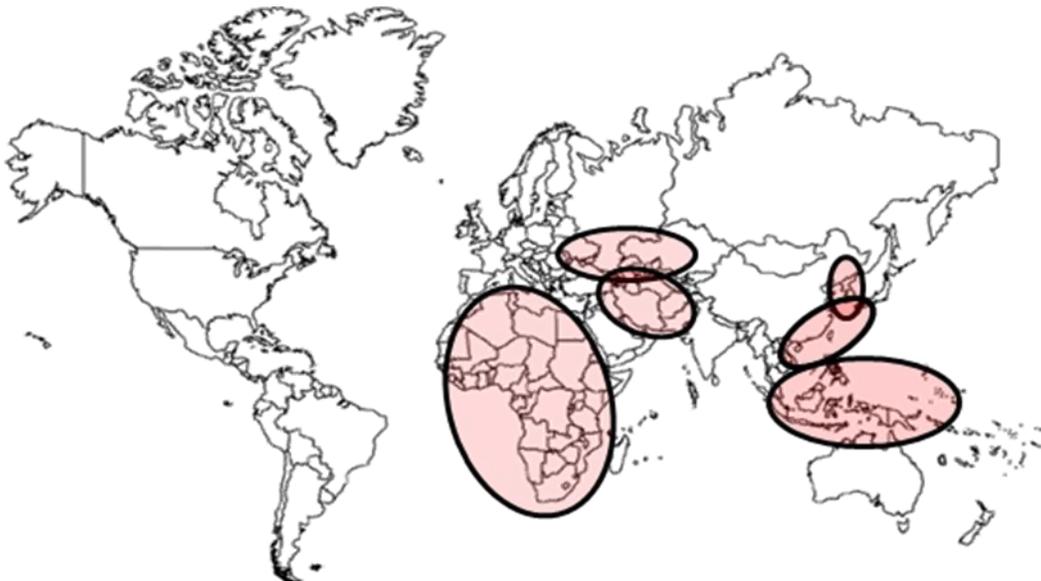
In 2007, in part responding to AMC's proposal for a new study of the en route system, USTRANSCOM began the Global Access and Infrastructure Assessment (GAIA). GAIA's stated purpose was three-fold:

- Examine global access and infrastructure supporting joint deployment and distribution enterprise (JDDE)
  - Access ... can we reach and enter required areas
  - Infrastructure ... do facilities permit required operations
- Shape and inform the OSD-directed Mobility Capabilities & Requirements Study (MCRS)
- Develop cohesive strategy to ensure global access and infrastructure, as necessary

The results of the study would be the foundation of a strategy allowing us to provide transportation support, whether by air, land, or sea, anywhere on the globe.

Unguided modeling of the world would have been an enormous undertaking and may have resulted in strategic direction that might not have provided adequate support to AMC global airlift operations. Consequently, AMC, with the support of USTRANSCOM, undertook building a high-level strategy informed by experience and intended to narrow the focus of the GAIA research. The ultimate goal of the strategy is global access. However, focusing solely on global access could result in misallocating resources, so the strategy should also focus on providing coverage of key areas. These areas (Southwest Asia, Southeast Asia, Korea, Africa, Eurasia and Indonesia) are defined as continuing zones of hostility or instability or areas prone to natural

disasters and have the greatest need for airlift support. Accordingly, the en route lay-down and infrastructure needed to be able to support a heavier flow to these regions.



The goals of the AMC strategy are to fill the global coverage seams with the full spectrum of passenger and cargo movement. The full-spectrum includes the least (minimum required to operate an AMC aircraft) to most capability (comparable to that available at Ramstein). This movement would be limited by political sensitivities (e.g., overflight restrictions, etc.) and optimized for a presumed tight fiscal environment. This fiscal environment would dictate that we optimize the use of existing infrastructure to maximize the return on prior en route infrastructure investments while identifying the next level of investment required to meet the strategy's goal. The strategy should also maximize the operational capabilities of our mobility platforms, but we must accommodate the limitations of services and support in those locations we could be asked to transit.

A brief note on the scope of this strategy: Strategic or tactical airlift missions are support-intensive enterprises. Large quantities of fuel are required, ramp space necessary to handle large aircraft is often limited, and cargo handling equipment, distribution capability, in-transit storage and the ability to handle passengers is required. On the other hand, some AMC assets, (e.g., air refueling and DV/VIPSAM aircraft) are self-deploying requiring very little on-site support. As long as parking space and fuel is available, they continue to operate. Consequently, the focus of the strategy is on the basing and infrastructure requirements to support the most demanding of the AMC assets—airlift. Finally, in order to be able to reasonably establish military construction projects, if needed, the strategy will focus on the years from 2015 to 2025.

## **5. STRATEGY ASSUMPTIONS:**

Since the proposed strategy is a prelude to the analyses of the GAIA and MCRS-16, a rather extensive set of assumptions had to be made. Some of the premises will continue to be assumptions in the aforementioned studies, while others may be eliminated. However, the

proposed strategy could not have progressed to this point without the following assumptions in place:

- The global political landscape in 2025 is similar to the landscape today
- There will be no significant change in overflight restrictions
- In 2025, the strategic airlift fleet will consist primarily of C-17s
- A C-17's unrefueled out-and-back radius is 2,000NM
- A C-17's point-to-point distance is 3,500NM
- Since the airlift capability of the new air refueling design has not been fully vetted, its capability was not considered.
- Every attempt will be made to maximize existing infrastructure within the strategy. In other words, as long as existing infrastructure can fit into the new strategy, the strategy should take best advantage of it
- In accordance with the President's statement and the statements of member nations, no permanent basing was planned on the African continent, except at Camp Lemonier, Djibouti. However, an Expeditionary Air Mobility Squadron (EAMS), while not specifically recommended anywhere in Africa by the strategy, should not be ruled out except by robust analysis of requirements and routes
- CONUS locations and end of the strategic airlift routes were not considered part of en route system. Some locations, Al Udeid for example, serve dual roles as APOEs and APODs. In these cases, we will treat them as en routes
- Every attempt would be made to maximize throughput while minimizing risks to mission success
- The strategy should maximize global coverage while concentrating on areas of concern
- The strategy would feed USTRANSCOM's GAIA which would provide the analytic underpinning and Joint Staff's MCRS-16

Finally, a quick look at a globe will reveal a basic geographic fact-of-life—90 percent of the world's landmass is north of the equator. Not surprisingly, 90 percent of the world's population lives north of the equator. These two facts drive the east-west orientation of this strategy. While not ignoring the existence of the 10 percent in the southern hemisphere, the proposed strategy is heavily weighted toward the northern hemisphere.

## **6. DEFINITIONS:**

The en routes are logistics-oriented organizations of aircraft maintenance and transportation (freight, passenger, and aircraft comfort servicing) activities. To define the size of an en route location, the size of the two logistics areas need to be scoped.

To that end, all references to maintenance capability conform to the definitions in the AMC Supplement to AFI 21-101. En route maintenance capability falls into three categories: major, minor and limited. AFI 21-101 AMCSUP 1 defines them as:

“Limited maintenance capability consists of general servicing tasks only. Minor maintenance capability consists of general servicing tasks, and 2-level maintenance component troubleshooting and remove/replace actions commensurate with MDS Minimum Equipment List (MELs). Major maintenance capability consists of all items

listed above, in addition to more in-depth troubleshooting for problem systems, and some backshop level tasks. Level of backshop capability will be determined through host tenant agreements/command to command agreements.” (A14.4.2.)

Aerial port capability is also broken into three categories, though they are not defined with the same rigor as the maintenance capability. Port capabilities are described as large, medium and small. They largely describe the manpower and facilities necessary based on passenger, cargo and aircraft fleet servicing requirements.

Therefore, combining the maintenance and aerial port capabilities into a single definition that captures the full spectrum of logistics capabilities results in the following definitions:

- Tier 1 = En route location with major maintenance and full service capabilities
- Tier 2 = En route location with minor maintenance and in-transit port capabilities
- Tier 3 = En route location with limited maintenance and limited port capabilities
- Expeditionary = En route location where all maintenance and port capability is provided as the mission dictates and by deployed personnel

Capability	Tier I	Tier II	Tier III	Expeditionary
Operations	24/7 w/ AMCC	24/7 w/ AMCC	Less Than 24/7, AMC Permanent Presence	No Enduring AMC Presence
Maintenance	WMOG = 3 Or More, R&R, Predictive Mx, Limited Backshop, 2 Or More MDSs, => 15 Acft/Day Throughput	WMOG = 1 Or More, R&R For 2 MDSs, 5-14 Acft/Day Throughput	WMOG = 0 – 1, 0-4 Acft/Day Throughput	As Mission Dictates Rotational Forces
Refuel	20 WB W/in 24 Hrs, Demand = 600K Sustained, 1M Surge 3M Gal Store	10 WB W/in 24 Hrs, Demand = 300K Sustained, 500K Surge 1.5M Gal Store	5 WB W/in 12 Hrs, Demand = 150K Sustained, 200K Surge 750K Gal Store	As Mission Dictates
Aerial Port	WMOG = 3 Or More Wide-Body Acft  Full hub/spoke services and passenger handling, provides full-spectrum to limited distribution services (multi-modal) in support of DPO mission, may include full break-bulk and cross-dock operations	WMOG = 1 Or More Wide-Body Acft  Provides in-transit aerial port support and passenger handling, to include: trans-load, moderate break-bulk, flightline-to-truck dock “customer receipt” aerial port services	WMOG = 0 – 1  Provides limited aerial port services and passenger handling, to include: import/export capability only--can expand services as required with manpower/equipment augmentation	As mission dictates rotational forces initially established with Air Mobility Contingency Response (port opening) capability. Can be sized as necessary to meet full distribution capability or limited “customer receipt” capability.

C2	24/7 ops, 2 or more controllers	24/7 ops, single controller	less than 24/7 ops	As required
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As can be seen, classifying locations by Tiers is not an entirely clean process across all functional areas. The most obvious problem lies in trying to fit aerial port capabilities into the Tier definitions. Classifying a location for port capabilities results in a significantly different picture of the en route than classifying for operations and maintenance. For example, compare the table on page 33 with the table at Appendix 3. However, while we recognize the differences between port capability and operations and maintenance capabilities, the differences are not significant enough to change the outcome of this paper.

## 7. GLOBAL STRATEGY:

The proposed global strategy that resulted from MRS-BURU provided an excellent baseline for continued reviews of the en route strategy. In the European theater, it identified the six locations for the first leg from the CONUS that proved crucial to continuing support to the warfighter at more distant locations. In the Pacific theater, the 2-lose-1 strategy recognized the lack of available real estate on which to establish a network of mobility support stops by focusing on locations lying along routes.

The primary drawback to this “location-centric” en route concept is that it promotes viewing the en route through its individual elements rather than as an interdependent system. This, in turn, can result in decision-making that fails to consider the effect on the entire strategy. This becomes particularly evident during periods of constrained resources and efforts to extract savings. For example, recent efforts to place Moron in a turnkey status focus solely on the historical use of the airfield. Additionally, efforts to reroute airlift flow to reduce fuel consumption fail to account for the impact on the entire en route system.

Consequently, this effort attempted to redefine the en route as a system of interdependent capabilities that, taken as a whole, help meet the nation’s inherent interest in global influence and projection.

It was determined that the strategy established in the Pacific theater actually did an excellent job of framing the en route capabilities as a system. In the Pacific, the en route strategy is based on the availability of two routes to the area of interest. The two routes are interdependent and mutually supporting and it allows one to more readily see the en route as a system of capabilities rather than a loose collection of locations.

To that end, this global strategy adopts the Pacific theater model of a route-based strategy in the European theater and continues the model in the Pacific. The strategy abandons the moniker of “6-Lose-1” that was focused on individual locations in favor of a three route strategy. The three routes are designed to service different areas of interest. Yet, they are mutually supporting so that the airlift requirements in a given area of interest can be supported from any two routes. This effort is intended to move the European en route from its location-centric focus toward a holistic and systematic view.

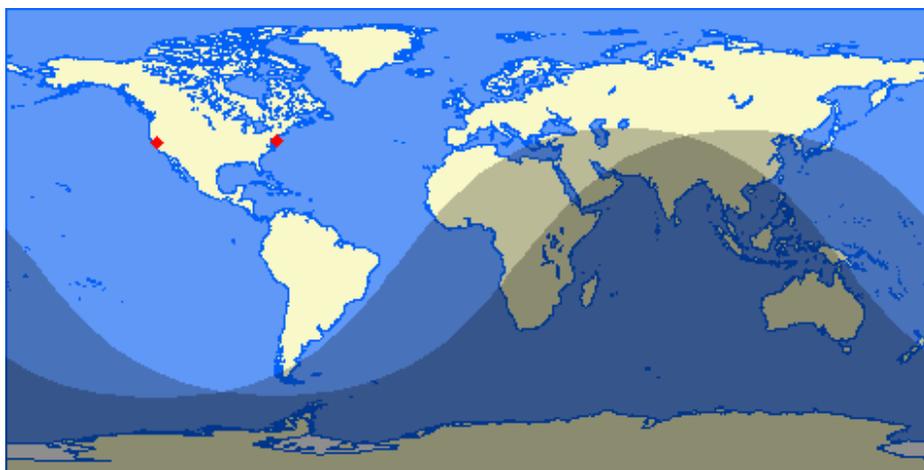
## 8. AIR REFUELING (A/R) AND THE EN ROUTE:

The Air Force's air refueling capability provides the nation an amazing capability to extend its reach to all segments of the globe. As stated in the 2008 Air Mobility Master Plan (AAMP):

*Air refueling is an important part of air mobility and serves to enable and multiply the effects of airpower at all levels of warfare. The Mobility Air Forces' air refueling (AR) capability makes possible the intertheater air bridge operations needed to support large deployments, humanitarian assistance, global strike, or the long-range airdrops of paratroopers and their equipment **without reliance upon intermediate or in-theater staging bases** [Emphasis added]. Air refueling provides the nuclear-equipped bomber force with the ability to deliver its payload to any location in the world and recover to a suitable reconstitution base. Combat operations require air refueling to extend the persistence and endurance as well as range of all aircraft.*

This range extension capability has tremendous potential to enhance the Mobility Air Force's velocity supporting the warfighter. The need for this capability was clearly seen during the historic Nickel Grass operation where C-141s and C-5s delivered weapons and supplies to Israel enabling them to prosecute and win a war before the first supply ship arrived. As a result of the experiences in Nickel Grass, the Air Force sought to expand its air refueling capability. The capability was crucial to the success of Desert Shield. It was the availability of air refueling that allowed many airlifters to operate at their maximum wartime gross weight that would normally limit their range.

Given the range extension advantage offered by A/R for a C-17, the following map shows how much of the globe can be reached from the CONUS in a basic crew duty day. Only the Indian Ocean region from southern/eastern Africa to Australia is outside the aircraft's reach. This is a powerful warfighting capability that must remain in the MAF's arsenal for use.



Accommodating the range extension capabilities afforded by A/R entails accepting a level of risk in airlift operations. These risks include the airlift asset not being air refueled due to weather (turbulence, clouds or icing), airspace limitations, mechanical malfunction, or tanker availability forcing the airlifter to land short of its intended destination. Furthermore, providing air refueling of airlift assets is intrinsically inefficient and should only be used to meet

operationally necessary timelines or conditions. It's far more costly in terms of fuel expenditure to launch a tanker than it is to schedule an en route stop along the airlifter's route. While we can certainly consider/plan for the use of A/R in extending the range of airlifters, we certainly cannot discount the possibility that A/R will not be available. If the en route system is not structured to accommodate this possibility, we risk that our airlift assets may land at a location where there may be no support. This was not a risk the original strategists were willing to assume.

However, when one looks at the most notable uses of A/R through history, the focus tends to fall on range extension for the bomber fleet in operations like Operation EL DORADO CANYON (F-111s attack Libyan targets) and the first combat sorties of DESERT STORM when Barksdale AFB B-52s departed Louisiana on 35-hour non-stop, round-trip missions to launch cruise missiles. The other high-profile mission for A/R assets is extending loitering time for fighters engaged in tactical operations. Additionally, during the Kosovo war, Air Force tankers provided ninety percent of all A/Rs for the NATO forces. These operations highlight the competition for limited A/R resources.

## **9. AIR REFUELING (A/R) EMPLOYMENT:**

Employment of the A/R assets is directed by an entirely different set of requirements than the employment of airlift assets. Rather than being dictated by the point-to-point delivery of cargo and passengers, tankers receive their requirements from the needs of those they intend to serve—receivers. In their primary role, tankers need to be responsive to when and where receivers require refueling. This could mean their primary mission is loitering over the ocean to permit fighters to fly non-stop from their CONUS base to an overseas location. Or they could orbit in the AOR affording attack aircraft added patrol time. Or they could be at locations strategically placed to allow heavily-laden airlifters the opportunity to deliver their cargo non-stop from the factory to the foxhole.

Consequently, designing an en route system for tankers operating in their air refueling role would entail knowing where the tankers would be expected to provide air refueling. Admittedly, this is a very operations-dependent determination and difficult for a strategy to anticipate. However, we can suggest likely locations to ensure they are capable for tanker operations based on historic use and known air refueling tracks.

Because the requirement for tankers operating as air refuelers is based on where the receivers are when they need refueling and not on the great circle range of a point-to-point mission, the decision matrix for where to locate them is fundamentally different. Helping us with the decision matrix is the fact that in many places of the world, air refueling is tightly controlled and the airspace strictly bounded. When an aircraft is planned to receive air refueling, it's typically within the confines of an established reserved airspace. Consequently, we should look for tanker en route locations in the proximity of these reserved air refueling areas.

In the Atlantic region, there are numerous areas reserved for air refueling off the west coast of Great Britain, France, and Spain. There are also A/R routes in Germany (though these are primarily for training and supported with USAFE assets), through the Mediterranean and near the Azores Islands. Fortunately, there are existing Tier III en route locations very near each of these regions. These Tier III locations by definition expect little airlift throughput. Therefore, provided adequate parking space is available, they would be ideal locations for self-deploying tankers to recover to or launch from in support of A/R missions. The locations we would suggest then as A/R tanker mission en route locations are Mildenhall, Fairford, Moron, Sigonella or

Souda Bay, and Lajes (Sigonella will be discussed further below as a potential tanker task force location). Each of these locations has more than adequate parking for tankers operating as A/R platforms.

A limitation at Sigonella is runway length. Presently, Sigonella has an 8,000 foot runway. As long as we maintain KC-135s in the inventory through the strategy period, which is expected, the temperature and runway length will be a limiting factor (primarily for emergency returns). Therefore, we recommend and support a runway extension of 2,000 feet at Sigonella to the Navy and Italian government before using Sigonella as a primary TTF location.

In the Pacific region, tankers suffer the same constraints that airlift aircraft have—lack of available real estate, especially along the Southern route. Should tankers perform A/R for aircraft transiting the Southern route, they have no choice but to use the same en route locations as identified for airlift aircraft. Hickam, Andersen and Kadena are all key locations for tankers.

With the buildup of forces at Andersen during the strategy period maximum use of the anticipated tanker task force should be planned. However, should this task force be unavailable, planner should consider avoiding Andersen with transiting tankers due to the potential for congestion.

On the other hand, the Northern route offers Tier III location well suited to tanker en route operations. In Alaska, the use of either Elmendorf or Eielson would allow tankers to refuel aircraft over the Aleutians and using the Tier III location at Misawa would allow access to A/R routes near the Japanese islands.

Finally, U-Taphao and Diego Garcia are ideal locations for aircraft heading west or for operations in their areas.

Historically, the use of tankers in their cargo mode has been limited. Approximately only 10 percent of air refueling missions have operated in a cargo-carrying mode. However, with the shift towards capabilities-based planning, the airlift role of air refueling assets is expected to be emphasized in the future.

The cargo capability of KC-135s is minimal—6 pallets or 18 short tons. The capability of KC-10s is more extensive—23 pallets or 60 short tons. Certainly the cargo capacity of the limited number of KC-10s is a considerable capability that the mobility system relies on. In addition, the future cargo capacity of the KC-X promises to be extensive. Their ability to augment the organic airlift fleet should be planned for and incorporated into any airlift strategy. When integrating tankers into the airlift strategy, it must be recognized that neither of the present-day aircraft have roll-on/roll-off capability and require specialized material handling equipment to reach the side door. Furthermore, when these aircraft do operate in a cargo mode, the air refueling capability is reduced due to weight restrictions.

Nevertheless, the demand for their air refueling capability, coupled with the aforementioned weight limitations while in the airlift role, means that the opportunities for tankers to haul cargo are minimal. Even robust forecasts plan on approximately 20 percent of total air refueling missions to operate in a cargo role. Given these indicators, we recommend that tankers, when operating in the airlift role, operate through the en route locations most appropriate for the cargo movement. Consequently, tankers operating in a TWCF airlift role, controlled by 618 TACC, use the en route system just as the C-17s or C-5s would. Neither manning nor infrastructure would need to be increased to accommodate the expected minor increase in flow this capability represents.

There are locations where basing a unit of tankers would not only serve heavily used air refueling routes, but also provide freight and passenger capabilities should that role be assigned

to the tankers. These locations would represent the most efficient basing of tanker assets. In the past, a deployment of a quantity of tankers to support an air refueling operation was known as a tanker task force. We recommend redefining this term to include the basing of tanker assets at a deployed location for the purposes of either or both air refueling and airlift operations. Consequently, a TTF could be employed to provide air refueling to a given operation or to fulfill a known airlift need or in support of both operations.

The parameters used to determine the optimal location for a tanker task force are relatively straightforward—1. Proximity to established air refueling tracks, and 2. Proximity to major airlift routes. Given these parameters, there are a large number of air refueling areas around the United Kingdom, Germany, and extending from east of Crete to Sardinia in the Mediterranean. Mildenhall, which is already configured to bed-down a tanker deployment, would have ready access to the UK and German air refueling areas for use by either eastbound or westbound mobility aircraft using the North Atlantic route. In the Mediterranean, Souda Bay, Crete, Sigonella, Sicily, Incirlik, or Moron, Spain, from which the Mediterranean A/R routes could be accessed, could provide support to the Central Atlantic route.

One location, in particular—Sigonella—provides us unique capability options and efficiencies the other locations do not. Because the Defense Logistics Agency has established a major warehouse capability, supplies destined for Africa may be congregated at Sigonella. We can, then, easily imagine a scenario where on a day-to-day basis the TTF could refuel aircraft entering or exiting the SW Asia AOR. Should a situation arise that small quantities of cargo need to be airlifted to an African operation, the tankers in the TTF could then be pressed into their dual role and carry the cargo onto the African continent (provided high-lift capable MMHE is available at the APOD). Or, if the quantity of cargo to be moved is large, provide infil/exfil air refueling for the African bound airlifters. Furthermore, the ability to resupply the fuel stocks via sea LOCs from the Mediterranean could ensure more reliable supply of fuel in greater quantities. Given this type of capability, we find the location of a TTF at Sigonella most reasonable.

As a side note, in the Mediterranean we have the option of seeking synergy with NATO, who is also reviewing locations for their Air Refueling Capability Package. Consequently, we suggest that any TTF location in the Mediterranean be predicated on the results of the NATO site selection and that AMC be a strong proponent of a NATO Air Refueling Capability Package located at Sigonella.

A TTF along the southern airlift route would help ensure that airlifters could deliver their cargo on the continent without requiring fuel at the APOD. As will be discussed in the en route strategy, the quality or availability of fuel on the continent is often questionable. Therefore, a TTF located to provide air refueling for airlifters during either infil or exfil could maximize the range of cargo delivery. To that end, we recommend that when a large airlift operation is expected along the southern Atlantic route, an expeditionary TTF be deployed to Ascension Island.

In the Pacific, we do not recommend a mobility TTF located at Andersen AFB once the GIMDP relocations are complete. The congestion anticipated at the base, especially in the event of a contingency, will render parking a TTF difficult. Instead, we suggest that any TTF for the Southern route be sited at Hickam and/or Kadena with Hickam as the preferred location. A Northern TTF could be sited at Eielson.

## **10. THE UNIQUE PROBLEMS OF AFRICAN COVERAGE:**

The African strategy is a work in progress. To date, USAFRICOM has not developed a long-term strategy from which airlift requirements can be derived. This is despite the fact that senior USAFRICOM officials are convinced that support for their efforts will require extensive strategic airlift. General Ward, USAFRICOM Commander, has stated "Predictable, reliable inter- and intra-continental lift...is so important for us today, as we then are postured and in a stance that will enable us to lead activity that helps to assure stability, as opposed to just reacting to a crisis," Clearly, there is the expectation that airlift support will be crucial.

However, infrastructure on the African continent for supporting strategic airlift movements is noticeable in its absence. Coastal locations, such as Dakar, Senegal, often have infrastructure capable of handling strategic airlift, but the infrastructure in the continent's interior is either absent or seriously degraded. Additionally, the coastal infrastructure is suffering. A recent USTRANSCOM survey of select African airfields revealed that infrastructure is degraded, poorly maintained or inadequate for sustained strategic airlift movement. Probably the most disturbing limitation is in the quantity and quality of aviation fuel. This limitation was highlighted during a spring 2008 POTUS trip on the continent. Considerable air refueling assets had to be used to offset the lack of fuel in sufficient quantities or of acceptable quality.

Further complicating the problem are statements from senior government leaders pledging that there will be no permanent basing on the African continent. While this doesn't seem to preclude an expeditionary presence, the net effect seems to be that anything more than transient and infrequent strategic airlift will be difficult or impossible to sustain from an African location. Fortunately, there is already an established base on the continent at Camp Lemonier in Djibouti and it appears to be enduring.

A promising method of delivering cargo by airlift is relying on the range of unrefueled strategic airlifters. As was previously mentioned, a C-17 can travel 2,000 NM, perform an engine running offload at the destination and return to the original departure location without refueling. Consequently, if a C-17 departs from a location on the perimeter of Africa, it can cover a rather large area of the continent. In fact, if one draws a 2,000 NM arc from some key locations, nearly the entire continent, with the exception of the southern tip, falls into one of the arcs.



(This, of course, is a rather simplistic view of achieving coverage of the continent. It does not account for known restrictions to aerial delivery, such as overflight restrictions and minimal air route structures.)

Consequently, the southern route of the Atlantic en route strategy seeks to take advantage of locations on the perimeter of Africa by using the unrefueled range of a C-17. The southern route shares many of the locations with the central route, in particular, those on the Mediterranean.

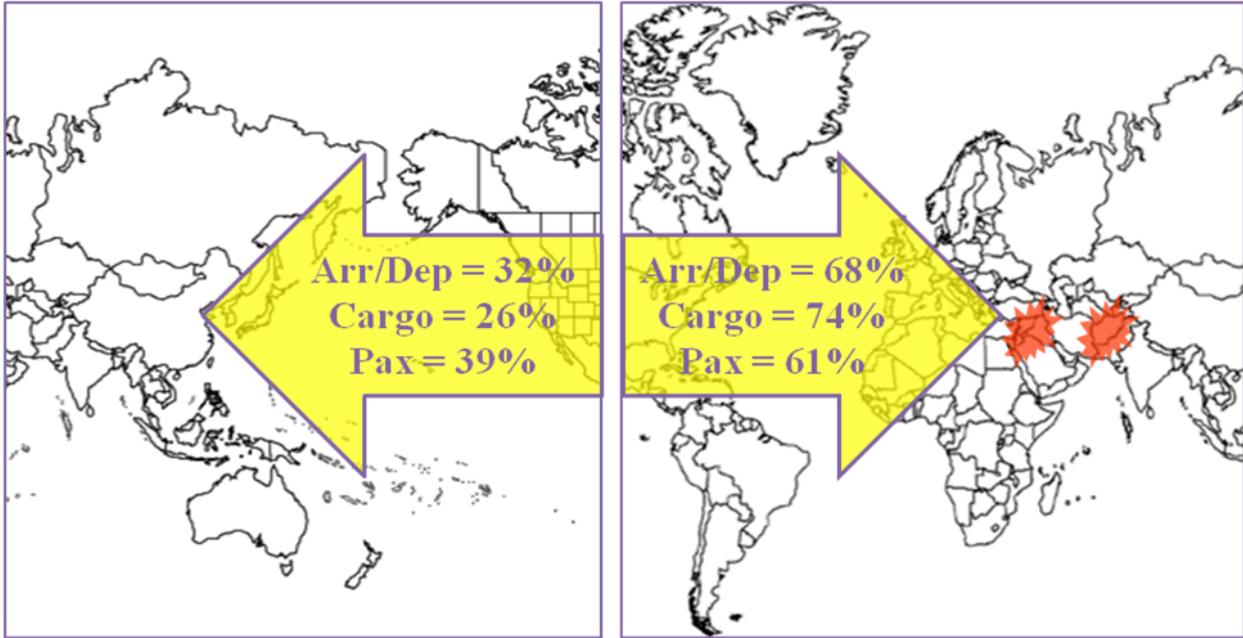
## **11. THE ATLANTIC (EUROPEAN/AFRICAN) STRATEGY:**

The proposed European strategy should be more appropriately called the Atlantic strategy. The names of the routes that define the strategy are based on their relative position over the Atlantic Ocean. Renaming also limits the notion that a regional command owns a portion of the en route system.

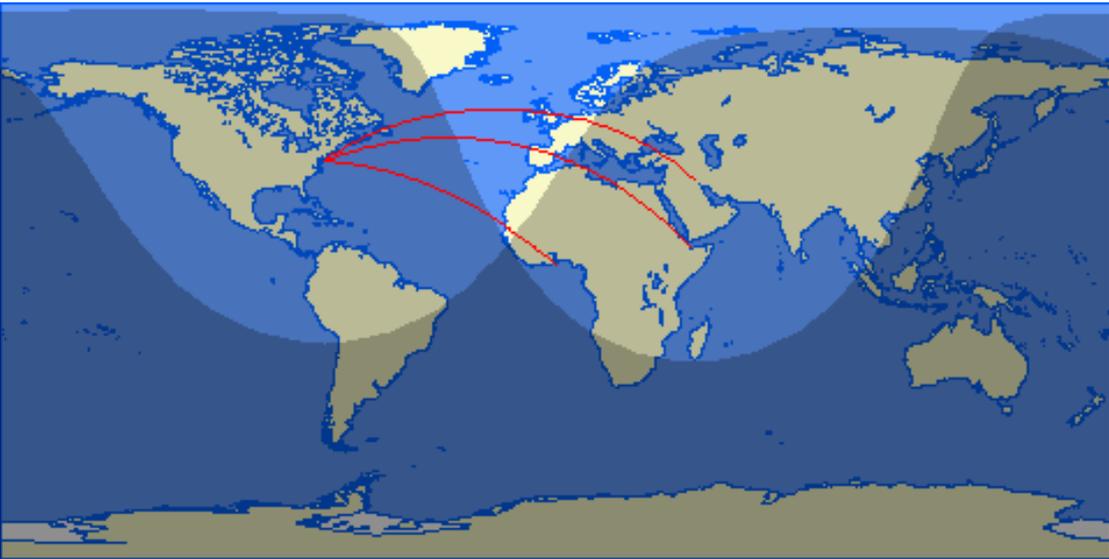
The ancestor strategy in this region was known as “6-Lose-1” and “Global En Route Strategy, USEUCOM.” The strategy was based on a “lens,” or a “sweet spot,” for strategic airlift operations (see map on page 20). Given a 3,500 NM point-to-point range of a C-17, the right-hand side of the lens defined the distance strategic airlift could fly from a mid-Atlantic CONUS location while the left-hand side of the lens defined the distance from a south-west Asian location. The area bounded by the two range rings is the lens—locations that could be reached from either the CONUS or SW Asia. To maximize the functionality of this concept, the 6-Lose-1 strategy focused on making the six primary locations in the lens region as strategic airlift-capable as possible.

The lens actually describes physical and technological limitations of the strategic airlift fleet laid on the geographic landscape. Those limitations have not changed, and given the pace of fielding technological advances, they will not have changed by 2025. Consequently, the concept of the lens will be no less valid in 2025 than it was when it was first conceived. Therefore, we are not abandoning the lens concept. Instead, we will refine its utility.

The following graphic depicts the airlift workload in 2007. The majority of the workload that crossed the Atlantic on its way to the warfighter passed through Ramstein AB. Ramstein represents the most capable en route airlift throughput location in the eastern hemisphere. Not only does it have the most advanced and thorough capability, but it’s also ideally situated along the great circle route to the USCENTCOM AOR and is centrally located within the lens. Paired with the relief location of Spangdahlem AB, it makes an ideal location on which to base a northern routing across the Atlantic.



If one looks at pure great circle routing from the east coast to Baghdad, Djibouti, or Ghana, one will begin to see the genesis for the routing strategy we propose to adopt. We propose that there are three primary distribution routes for supplying the warfighter—northern, central and southern routes. These Atlantic routes have the advantage of providing overlap for each other. In other words, should the northern Atlantic route not be available for weather, political or saturation reasons, supplies en route to southern Eurasia or southwest Asia can be routed through the central route. The central route also provides access, with the southern route, to the African continent. This feature of the Atlantic routes leads us to postulate an alternate name for the Atlantic strategy—“Three-Use-Two.” In other words, we have three routes across the Atlantic and for any given action in one of the areas of interest, two of the routes are available for delivering supplies to those areas.



The most direct routing (and the most fuel efficient routing) to southwest Asia or Southern Eurasia, carries us across northern and eastern Europe. Mildenhall, Spangdahlem, Ramstein, Constanta, and Incirlik all lie within close proximity of this northerly route. These bases possess the most robust existing infrastructure in the entire theater. However, the northern route is hindered by poor weather and limited operating hours at nearly all locations, which make planning and scheduling across international boundaries problematic. This latter issue includes rerouting to accommodate political sensitivities.

Along the northern route, our most capable location with the greatest throughput capability is Ramstein AB. Its massive mobility ramp, state-of-the-art freight facility, and C-5 capable hangar make it Europe's only Tier 1 location at present. Its paired location, Spangdahlem AB, has lesser throughput capability, but is robust in its own right. We suggest that to provide adequate throughput along the northern route, Spangdahlem should remain a Tier II location and should be considered an essential pairing with Ramstein.

RAF Mildenhall remains a strategically crucial en route location. Located on perhaps the most politically friendly country in Europe, it will be valuable for basing mobility operations should operations become politically more problematic across the European continent (an example of which was Operation EL DORADO CANYON, the bombing raid into Libya). The base has a robust passenger and freight handling capability we should not abandon. It is also a valuable resource should mechanical problems force an aircraft to stop short either east- or west-bound. However, as velocity has driven consolidation of organic airlift assets for efficiency, Mildenhall has increasingly been overflowed by our organic fleet in favor of the locations in Germany. Recognizing this fact, we recommend that Mildenhall downsize to a Tier III location.

In the British Isles, a more central location on the great circle route between the east coast of the US and the Persian Gulf is Shannon, Ireland. Presently, AMC contract commercial carriers use Shannon as a fuel stop as they return to the CONUS. Due to its central location, it would be an ideal gas-and-go location. However, any AMC presence there would be duplicative of the presence at Mildenhall and fails to recognize the existing efforts to consolidate throughput for efficiencies. Consequently, we recommend that the Tier III presence at Mildenhall be capable of moving TDY personnel augmented from CONUS locations to man the expeditionary gas-and-go capability at Shannon.

Our experiences during Desert Shield/Storm and OEF/OIF have highlighted the importance of en route locations subsequent to the first leg en routes. Both Incirlik AB and Al Udeid AB are crucial as transload locations—a transition from intratheater to intertheater. As such, their throughput capability is crucial to ongoing operations. Additionally, both have proven their value during OEF/OIF. With continued areas of interest in this region, transload capability will continue to be crucial. Consequently, we recommend that both Incirlik and Al Udeid be upgraded to Tier II locations.

Air mobility operations at Al Mubarak AB, Kuwait, have endured since the end of Operation DESERT SHIELD. This large capacity aerial port provides a vital distribution link in support of CENTCOM operations and is tied directly into the Defense Distribution Depot Kuwait-South West Asia (DDKS) and the Theater Consolidation and Shipping Point (TCSP). Based on the historical workload and its key multi-modal distribution capability, we maintain Al Mubarak as a Tier II location.

Southern Eurasia is a developing area of interest and USEUCOM is already establishing a presence in Romania in response. US Army Europe (USAEUR) now has a major training

range and center of operations in the area around Constanta, Romania. Mobility will be required to support these and developing operations in the area. A number of options for a Tier III location appear suitable to take advantage of the seaports on the Black Sea. They include Odepeni, Romania, Mihail Kogalniceanu Airport, Romania (LRCK), Varna, Bulgaria (LBWN) and Burgas, Bulgaria (LBBG). All have runways that are more than 8,000 feet in length, are in close proximity to sea ports (with the exception of Odepeni), and would require some degree of repairs or construction to make them suitable for transiting MAF aircraft.

A second Tier III recommendation is for Bagram AB, Afghanistan. We anticipate that our need for a mobility throughput location in the region will endure well past 2025. Military or stability support will be a hallmark of the region. Despite its high altitude and dangerous topography, the current infrastructure and planned infrastructure by USCENTCOM makes Bagram an ideal location for mobility operations. Based on its current and projected distribution mission, Bagram's port throughput more closely resembles a Tier II location.

Along the northern route there are numerous locations that support mobility operations, but are closely tied to existing operations. These locations are essential, but may, in fact, be temporary and only needed during contingency/wartime operations. RAF Fairford, Kuwait-Ali Al Salem, Kandahar, Papa Hungary, and Bahrain fall into this category.

The most direct routing to the Horn of Africa and eastern African locations is across the Iberian Peninsula and through the Mediterranean. Rota, Moron, Sigonella, and Souda Bay lie close to this central Atlantic routing. While not the most fuel efficient, this central routing through the Mediterranean has advantages over the northern route. The weather is more consistently conducive to flying operations and there are fewer international overflight issues. These advantages make it an ideal route for northern route overflow or restrictions. It is also the ideal route for commencing operations on the African continent. For instance, the air distance from Rota direct to Djibouti is slightly over 3,000 NM, easily within reach of all our strategic airlifters. After a refuel stop in Spain, a C-17 or C-5 could reach to south of the equator in Africa, as long as fuel is available at their destination.

NAVSTA Rota, paired with Moron AB, provides the anchor for the central Atlantic route. Presently, Rota is our only European base with 24/7 operations and represents a tremendous capability for the timely movement of supplies to Southwest Asia. Rota also has the unique attribute of having a seaport attached to the airfield which allows multi-modal operations to occur within the perimeter of the base. For these reasons, and because we anticipate an increase in mobility operations destined for Africa, we suggest that Rota be upgraded from its Tier II status to a Tier I location by enhancing the maintenance footprint. In essence, this would entail an enhancement of the maintenance capability (backshop).

Moron AB represents tremendous capability with the largest parking ramp in theater and no threat of noise-restricted hours. Therefore, we recommend that Moron continue as a Tier III location. To further enhance its capability, we recommend returning Moron to a 24/7 operation at least during the summer tourist season. Ensuring unrestricted operations at Moron will mean splitting the traffic destined for the Iberian Peninsula between the two bases.

Sigonella and Souda Bay present unique issues for the central route. At 4,100NM and 4,500NM respectively, they are too distant for a first leg from the CONUS. However, they are well within C-17 range from both Afghanistan and Qatar. The real value of Sigonella and Souda lies in their location in the Mediterranean, extensive Defense Logistics Agency's warehousing infrastructure in Sicily, and their proximity to Africa. Access to both locations can be achieved via relatively unrestricted overflight of the Mediterranean. The Headquarters Defense Logistics

Agency is building a regional headquarters logistics supply stores on Sicily, which will result in greater cargo generation for delivery to or from Sigonella. Finally, due to the extensive European colonial history in sub-Saharan Africa, access to the African continent may be politically untenable from any number of locations depending on the overflight routes and destination (Greece, and so Souda Bay, is not among the African colonial powers). Having alternative locations from which access to the African continent is possible becomes increasingly important. Consequently, we recommend Sigonella become a Tier II location with the addition of an air mobility squadron and Souda Bay become an expeditionary location capable of becoming a Tier III location requiring parking ramp expansion and mobility operations capabilities. We make this recommendation recognizing that interest in Sigonella as a location for basing UAVs is increasing. Therefore, we will work closely with USAFE and the Navy to determine the ability of Sigonella to handle an increased mobility mission.

The central Atlantic route shares many second leg locations with the northern route. For example, Incirlik and Al Udeid would be second leg Tier II locations while Bagram would be a second leg Tier III location. A second leg location unique to the central route would be Aviano, a Tier III location primarily to support Army units in that region.

In addition to those locations mentioned for the northern route and previously mentioned Souda Bay, another expeditionary central route location would be Cairo West, which is a key location for numerous USCENTCOM exercises.

Finally, the southern Atlantic route is designed solely to provide mobility support to the African continent. As previously mentioned, the proposed strategy takes advantage of locations on the perimeter of the continent. In this regard, the southern route shares many locations with the central route—Rota, Moron, Sigonella, Souda Bay, and Cairo West.

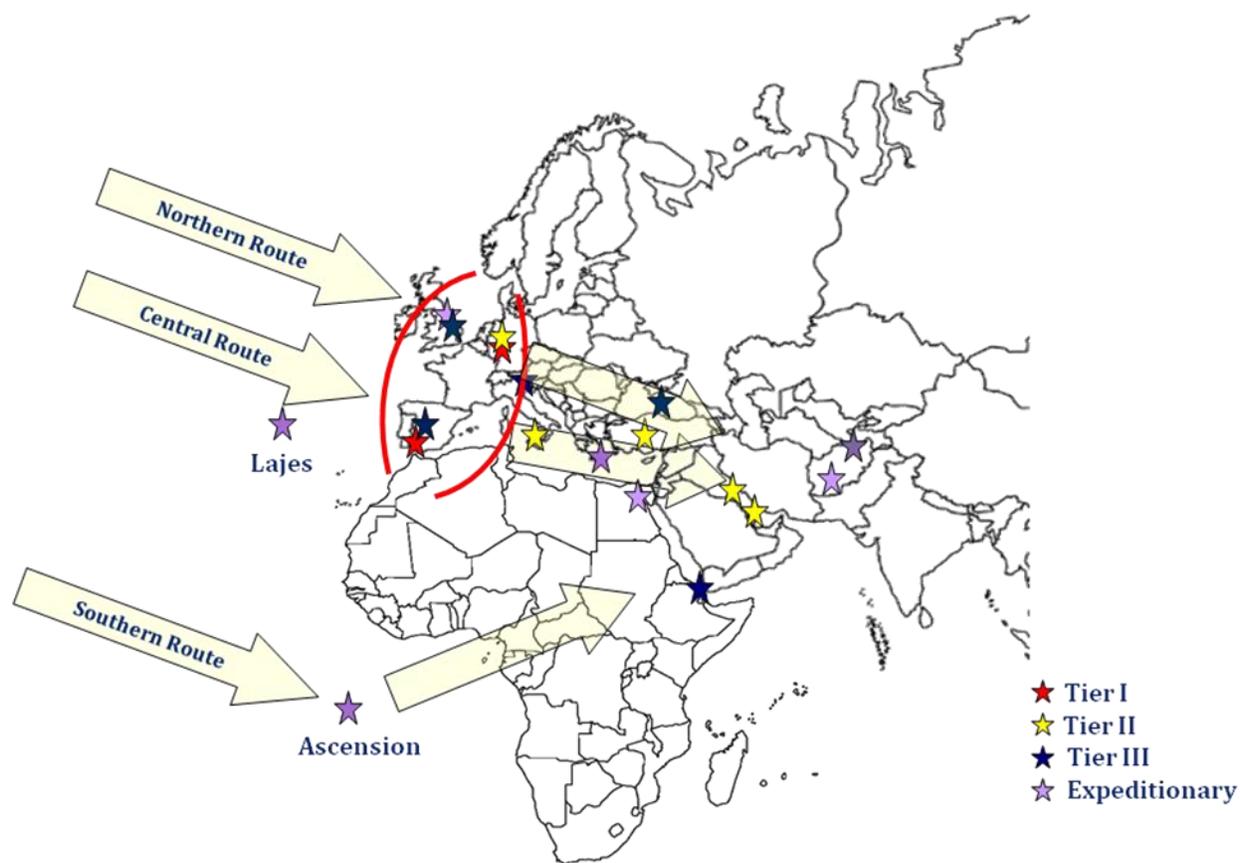
An additional location, not mentioned as part of the central route, but could be considered part of that route, is Lajes Air Field. Again, Lajes is a location that fighters find crucial for crossing the Atlantic; however, due to its proximity to the CONUS, it is infrequently used by mobility aircraft and only then primarily to support the airfield. Additionally, the Azores are frequently battered by strong winds during the winter that effectively shuts down operations. With the anticipated increase in African mobility requirements, Lajes' role as a portal onto the African continent may increase. Additionally, since Lajes is an island situated in the Atlantic, it makes an ideal divert location for aircraft crossing the Atlantic. Consequently, we do not recommend abandoning Lajes. Although there are locations from which African access is easier and more effective, Lajes is an important backup location and we recommend maintaining the option for its use, but downgrading Lajes from its current status to an expeditionary location.

Two locations, unique to the southern routing and essential for airlift coverage of Africa, are Ascension Island (Wide Awake Field) and Camp Lemonier, Djibouti. Ascension is a British owned island in the south Atlantic. Its location south of the equator and midway between South America and Africa makes it ideal for access to west and southwestern Africa. US military aircraft have used Ascension in the past, and we anticipate no problems for continued use. However, the increased traffic to support USAFRICOM could involve an expanded parking ramp and fuel storage. These enhancements, as well as increased use, would need to be negotiated with the United Kingdom.

Camp Lemonier, Djibouti, is the only permanent infrastructure on the African continent that this strategy assumes. As such, its importance can't be overstated. Of all the locations on the southern route, Djibouti provides the single point of greatest coverage. Using the 3,500NM point-to-point C-17 range, the entire continent can be accessed. Using the 2,000NM unrefueled

range, two-thirds of the continent can be accessed. Currently, the airfield has limited mobility aircraft servicing capability. An enlarged parking ramp and freight handling capability would be required to establish a Tier III capability as we envision. (Should analysis of the evolving requirements (to include responsiveness, timeliness, and MHE/personnel required to provide the needed capability) dictate and political dialogue permit an expeditionary location on the west coast of Africa, options do exist and will be evaluated.)

The following map graphically depicts the Atlantic “three-use-two” route strategy described above:



## 12. SOUTH AMERICAN STRATEGY:

Including South America in a global en route strategy accomplishes two results: it helps achieve the regional engagement strategy and assists with the mobility routing to Africa. Unfortunately, a South American engagement strategy that tasks airlift assets is not available. Until recently, security concerns in South America have focused on the counter-narcotics mission. That mission has not required the use of strategic airlift in its prosecution.

Recently, USSOUTHCOM has become interested in establishing a location on the South American continent that could be used both for counter-narcotics operations and as a location from which mobility operations could be executed. Consequently, with the assistance of AMC

and USTRANSCOM, USSOUTHCOM has identified Palanquero, Colombia (German Olano Airfield (SKPQ)), as a cooperative security location (CSL). From this location, nearly half of the continent can be covered by a C-17 without refueling. Should suitable fuel be available at the destination, a C-17 could cover the entire continent, with the exception of the Cape Horn region in Chile and Argentina. Until such time that USSOUTHCOM establishes a more robust theater engagement plan, the strategy to place a CSL at Palanquero should be sufficient for air mobility reach on the South American continent.

In conjunction with the aforementioned CSL, Puerto Rico and the US Virgin Islands offer viable en route locations capable of supporting theater mobility requirements. Both San Juan and Henry Rohlsen International Airports have resident Air National Guard facilities that currently support mobility operations into South America. Puerto Rico and the US Virgin Islands have two of the largest sea ports in the Caribbean, minutes away from their respective international airports facilitating intermodal operations. Neither location requires international agreements, customs, or diplomatic clearances for overflight. These two airfields offer ideal hub locations to support emerging contingency and humanitarian relief operations. Finally, AMC should work closely with USTRANSCOM to establish contracts or agreements with commercial concerns for contingency fuel and aircraft support at airfields in more southern reaches of the continent.

Previously, we discussed using Ascension Island as a portal for access to the African continent. Routing to Ascension, though, requires an intermediate fuel stop and that stop would be in the Caribbean or South American region. The distance from Charleston AFB to Ascension is over 5,100NM, well outside an unrefueled C-17's range. In the past, AMC aircraft on their way to Ascension stop in Antigua (V.C. Bird International) to refuel. The distance from Charleston AFB to Antigua is nearly 1,600NM with the remaining distance to Ascension being cut to 3,600NM.

USSOUTHCOM, in an attempt to assist with access to Africa, has postulated that Cayenne, French Guiana, could serve as a possible CSL for an intermediate fuel stop between the CONUS and Ascension. The distance from Charleston AFB to Cayenne is 2,600NM and the remaining distance to Ascension is only 2,400NM. USSOUTHCOM has also considered access to the airport at Recife, Brazil. A C-17 could depart from this location and, provided fuel is available when they land, cover approximately the same area as an unrefueled C-17 from Ascension. However, the political relationship with Brazil is not conducive to the necessary agreements. Furthermore, Recife is 4,100NM from Charleston AFB placing it just outside the point-to-point distance for a C-17. Therefore, we recommend that USSOUTHCOM continue to pursue access to the airfield at Cayenne, French Guiana.



### 13. PACIFIC STRATEGY:

As discussed, the limited availability of real estate in the Pacific allows few options for en route locations. Fortunately, the location and political affiliation of Pacific islands provide en route strategy options to prevent reliance on a single route to the warfighter.

This fact was clearly recognized in 1999 when the PERISC first postulated the “2-Lose-1” route strategy. Recognizing that one of the routes may be temporarily unavailable due to inclement weather, the PERISC recommended sizing the locations on the two routes such that one route could handle the temporary surge of the other being unavailable. Given the limitations of the region, we agree that this strategy is sound and should be continued.

However, since 1999 the focus areas in this region have expanded to include the Indonesian islands as a source of political turmoil and geologic instability. Furthermore, the existing en route locations are subject to refinement to make the system more responsive and capable. Consequently, we now refer to the strategy in this region as the “Two Route Plus” strategy. The strategy still refers to two primary routes, the Northern and Southern routes. The “Plus” alludes to the fact that our refinement of the strategy enhances what the PERISC originally proposed in 1999.

The Northern route more closely follows the great circle routing to the Korean peninsula and China Sea areas of interest, making it the more fuel efficient routing to two of the three areas of interest. However, due to its northern orientation, the impact of winter weather is severe and requires locations along the route to be adequately supplied with deicing and snow removal equipment. Furthermore, because the Northern routes depend on the Japanese locations of Misawa, Yokota, and Iwakuni for its second leg stop and that Japan is close to both northerly areas of interest, the threat from battle damage on Japanese locations is proportionately higher than at more outlying locations.

The Southern route, on the other hand, is far less fuel efficient and represents an actual increase in distance to the areas of interest. For example, the distance from Travis AFB to Osan AB, Korea, using the Northern route is approximately 5,300NM. From Travis to Osan using the Southern route it is 6,000NM if flying direct from Hickam to Yokota (2 additional flying hours) or 7,100NM if routing through Guam (4 more flying hours). Typhoons are a threat in many locations, but particularly at Guam.

Nevertheless, when not threatened by typhoons, the Southern route boasts far more predictable and favorable flying weather. Support to the Navy is crucial at many of the Pacific island locations and the threat from enemy action is more remote along the Southern route. Historically, the flow of Pacific airlift is through the Southern route due to these very issues.

Due, in part, to the basing of C-17s at both Hickam AFB and Elmendorf AFB, the Pacific has the luxury of two Tier I locations, one on each route. Hickam is manned and has the infrastructure to provide Tier I capability. This is a crucial capability to mitigate the chokepoints along the Mid-Pacific route.

Chokepoints are points along the route where there are few, if any, available alternates should the single location be unavailable. In nearly all instances, a primary location on a route is paired with a location of lesser capability that can serve as an alternate. For example, Elmendorf is paired with Eielson, Rota with Moron, and Ramstein with Spangdahlem. However, on the Southern route, Hickam AFB and Andersen AFB are not paired with alternates. While alternate locations exist in the Hawaiian Islands for diversion, Hawaii isn't frequently threatened by inclement weather and there is very little threat from enemy attack. The need for an alternate location is less compelling. Consequently, it is prudent to ensure that Hickam maintains a Tier I capability. Proposed alternate locations for Andersen AFB will be discussed later in this document.

Elmendorf currently possesses the infrastructure for Tier I capability, but it is not currently manned to accomplish Tier I activities. Since Eielson is used as an alternate location and there is a greater likelihood that Northern Pacific routing will not be used due to inclement weather, the need for Tier I capability is not critical at Elmendorf. Consequently, we suggest that Elmendorf maintain Tier I infrastructure while maintaining its current manning.

The second legs in the Pacific strategy are considerably more controversial. On the one hand, the second leg locations on the Island of Japan are somewhat fixed and their tier sizes seem driven by momentum rather than strategic importance. On the other hand, the second leg location at Andersen AFB represents perhaps the most significant air mobility chokepoint on the entire globe.

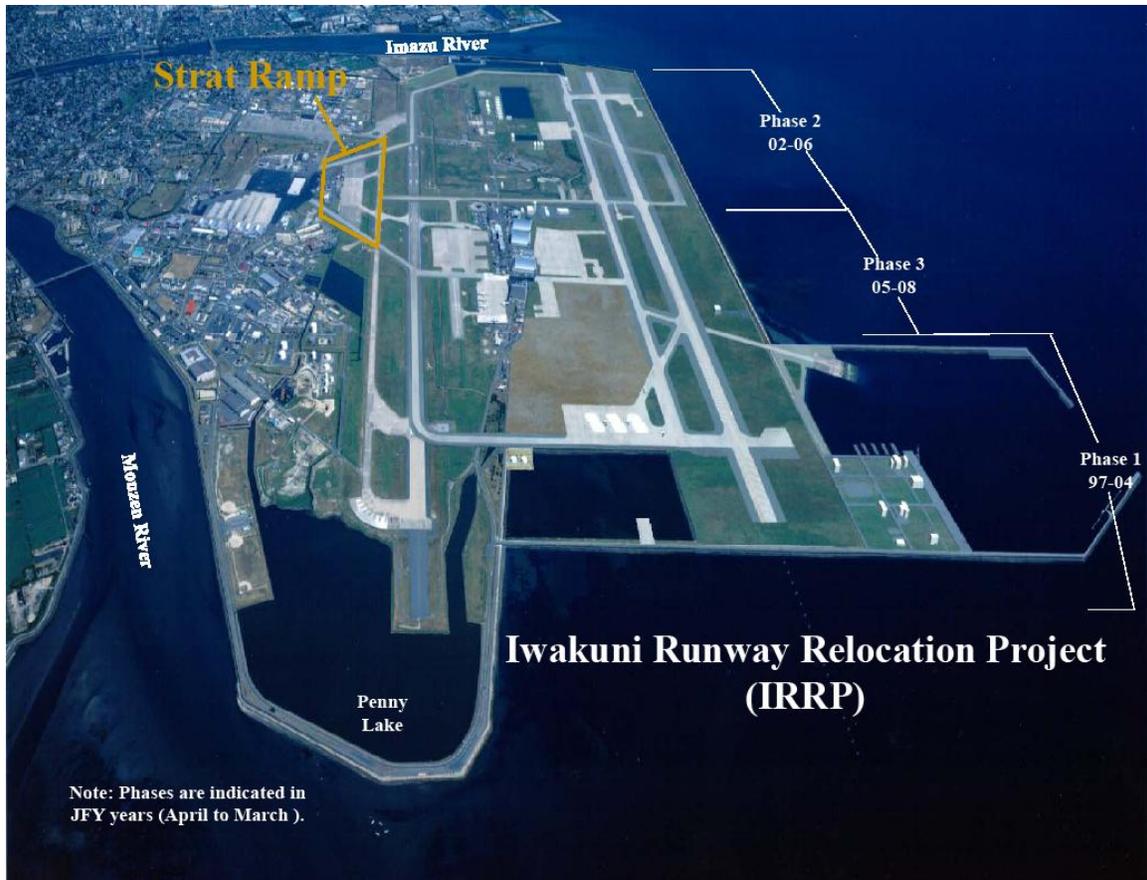
Currently, there are four en route locations on Japan—Misawa in the north, Yokota near Tokyo, Iwakuni on a deep-water bay in the south of the main island, and Kadena on the island of Okinawa. Each has varying degrees of capability with Yokota and Kadena representing the greatest throughput capability. At the locations other than Yokota, mobility operations are

considered an adjunct mission to the primary missions. In fact, Iwakuni is a Marine base. AMC operations at Iwakuni are minimal and are frequently supported with TDY personnel from the AMS at Yokota. At other times, Marines provide transient aircraft servicing.

Yokota was established post-World War II and maintained as a forward base. Since WWII, Tokyo has become among the world's largest cities and the urban sprawl has engulfed the base. Still, of the four Japanese locations, Yokota's primary mission, for both PACAF and AMC, is mobility operations. PACAF maintains C-130 and operational support airlift units at Yokota and synergies are achieved with AMC mobility throughput. In FY09, construction will commence on a new mechanized materiel handling system funded nearly entirely by the Japanese government. Additionally, the base holds a number of USPACOM/PACAF/Joint Japanese Defense Force headquarters.

However, many challenges exist at Yokota. First, Yokota AB is centrally located in Japan, but is surrounded by high-density civilian population. In many areas there is no buffer between the perimeter fence and the civilian population. Additionally departure obstructions plague the airfield. Second, the regional government routinely makes concerted efforts to transform Yokota into a joint military/civilian airfield, which would permit civilian use of the field for freight and passenger service. The US has been successful in staving off these proposals and, to date, the national government has not supported the prefecture governor's proposal for military/civilian dual use. Finally, and most significantly, fuel delivery to the base is accomplished via railcar. This overland delivery of the airfield's lifeblood is fraught with vulnerability and subject to environmental concerns that may make it increasingly politically unsustainable. Because of these geographic and political constraints, it is prudent to plan for an alternate location in Japan in the event Yokota become untenable.

An ideal alternate location for Yokota is Iwakuni. Iwakuni's location on an island extending into the deep-water Sea of Aki means that only one section of the base perimeter experiences civilian encroachment, while the rest of the base is surrounded by water. Although the water boundary limits civilian encroachment, it also limits the ability to expand the base. Nevertheless, there is a land reclamation project currently underway to build a second runway. The new 10,000 foot runway is expected to be operational by 2010.



Perhaps the most promising and useful feature at Iwakuni is the deep-water port attached to the base availing multi-modal capability comparable to that found at NAS Rota, Spain. This is a key advantage for any operating location. The ability to trans-load from ship to aircraft or aircraft to ship maximizes the limited space available in the theater. Furthermore, fuel for the base is delivered from ship within the confines of the base perimeter, significantly reducing force protection concerns.

Iwakuni is not without limitations. The most obvious limitation, when compared with Yokota, is that construction would have to occur to enhance its throughput capability to a Tier II level. While a new 4,000 square meter passenger terminal is under construction, there is inadequate freight handling capability. Additionally, the ramp available for mobility aircraft is limited in size and should be expanded. It is currently capable of only accommodating three large aircraft. All proposals to expand capability on the base, either with infrastructure or personnel, would require agreements with the Marines and the Japanese government.

Consequently, we recommend putting the necessary infrastructure in place at Iwakuni to make it a Tier II location in the event that we can no longer maintain Yokota at that level. At present, we do not propose drawing down Yokota to a Tier III location. Rather, we suggest that Yokota remain Tier II subject to continuing reviews. We do not recommend changes to Misawa or Kadena.

Andersen AFB, Guam is a Pacific chokepoint of key concern for numerous reasons. First, it tends to be a common target for Pacific typhoons. Second, the entire island will soon experience an expanded military presence under the auspices of the Guam Integrated Military

Development Plan. Third, with the addition of new flying missions, there will be an increased demand on fuel, which originates at the naval port on the opposite side of the island. Fourth, should a large-scale regional conflict arise, Guam could very well be subject to battle damage threats, especially given the confluence of military units gathered on the island. The impact of these concerns is an increasing threat to airlift throughput at Andersen AFB.

Several issues arise when considering this threat. The existing infrastructure at Guam is inadequate to support the expanding missions. A new freight terminal to be constructed in the AMS Campus is currently programmed and will need proper advocacy to compete for MILCON funds and remain in the FYDP. A new passenger terminal to replace the woefully inadequate existing terminal is planned and coordinated with the host wing, though it, too, will require command advocacy to compete in the POM. The current terminals are capable of handling 100 passengers and one C-17 cargo load. Also, the mobility parking ramp should be expanded to permit additional parking and an accessible footprint for performing required or preventative maintenance.

Still, these enhancements won't obviate the concerns raised by weather, encroachment, fuel delivery, or battle damage. Consequently, we believe it is prudent to seek a paired location for Andersen—a location close enough to allow continued mobility throughput to Guam during periods when the base is unavailable during weather, high ops tempo, or fuel demand.

Available airfields in the region are few and far between. Fortunately, at a little over 100NM north of Guam lie the islands of Tinian and Saipan. These islands are in the Commonwealth of the Northern Marianas, which are US possessions. Both islands have airports, though Saipan's is the larger of the two. Saipan's international airport has an 8,700-foot runway and adequate contingency parking area for wide-body aircraft (two wide-body and three narrow-body spots). It is close enough to Andersen that if mobility operations needed to be diverted, they could continue at Saipan, perhaps with a transload to another aircraft to ferry their cargo to Andersen.

Locating an expeditionary capability at Saipan would require conducting negotiations to secure guaranteed access and potentially constructing the necessary infrastructure to ensure the ability to service mobility aircraft, e.g., enlarging the fuel storage capacity. We don't recommend a permanent manpower presence at Saipan. Rather, should Saipan be necessary due to the loss of Andersen for mobility aircraft, personnel from Guam could deploy to Saipan to establish satellite operations, thus allowing mobility operations to continue on the Southern route. We will work closely with PACAF to secure access to Saipan or a different, more suitable location.

Finally, the areas of interest in the south China Seas and Indonesian/Philippine Archipelago are currently covered by several small locations—Clark, on the Philippines, U-Taphao in Thailand, Singapore, and Richmond, Australia. The capability inherent in these locations is based on small throughput and infrequent use. Based on anticipated interest in the area and seemingly routine natural disasters requiring extensive humanitarian relief, we recommend establishing a location in the region with more robust capabilities than expeditionary.

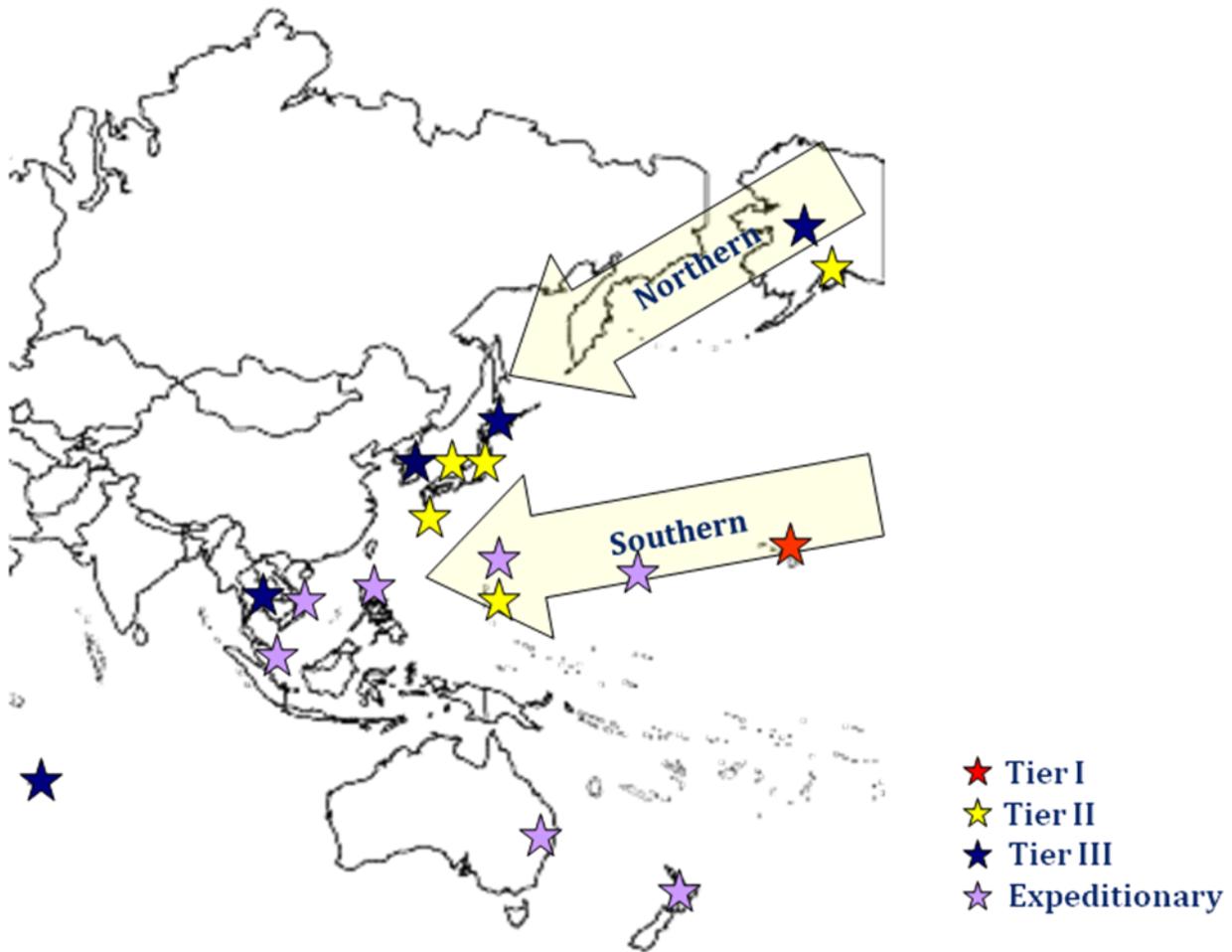
The most robust of these locations is currently the detachment at Singapore's Paya Lebar airport. The key mission for this AMS detachment is to service airlift transporting supplies and support to the large naval port on Singapore. Air access to Singapore is relatively benign from the east. However, due to overflight restrictions imposed by numerous countries in the region, departures from Singapore heading westbound require circuitous routing to avoid country

overflight. Furthermore, the ability to transit hazardous cargo through Singapore is very tightly regulated.

We presently have an expeditionary location at U-Taphao, Thailand. This location has more than double the wide-body, narrow-body, and hazardous cargo parking spots than Singapore and has seven fuel hydrant parking spots. Westbound overflight from U-Taphao is essentially unrestricted. The capacity to handle large airlift flows to the region far exceeds that available at Singapore. The infrastructure required to establish U-Taphao as a Tier III location would be minimal.

Another location in the region to consider is Cam Ranh Bay, Vietnam (VVCR). Relations between the US and Vietnam have warmed significantly over the years. It may now be possible to pursue negotiations with the Vietnamese for use of an airfield and basing of personnel. Cam Ranh is a joint use, military and civilian, airfield with 10,000 foot runway and considerable parking apron space. Arrival at Cam Ranh from the east involves no overflight restrictions while movement to or from the west involves only minor restrictions. The area of C-17 coverage in the area is comparable to that available from U-Taphao. Based on these facts and given the warming relations with Vietnam, we believe that Cam Ranh presents an ideal opportunity for future basing should the need arise.

Consequently, we recommend keeping Singapore as a location for support of the Navy port while establishing U-Taphao as a Tier III location to serve as a central location for access into Indonesia and the South China Sea. Furthermore, we believe that Da Nang airport should be held in reserve as a potential resource should the need arise and recommend continued diplomacy with Vietnam for that purpose.



#### 14. OTHER LOCATIONS:

An issue related to the en route, but not technically considered part of it, are those locations most prominently used for fighter ferry missions—Coronets. The most obvious location is Wake Island Airfield. This location is strategically located for fighters transiting the Pacific. Without it, they would need to change their routing and would require additional A/Rs to maintain minimum fuel levels in flight. This fact elevates the importance of Wake for AMC. Very likely, without it AMC would be required to devote more tankers or risk longer boom times to these fighter ferry missions. Admittedly, AMC aircraft do land at Wake. For example, from 1 Dec 07 through 30 Nov 08, three C-17s, eight KC-10s and fifteen KC-135s transited Wake Island. While this does not rise to the level of an en route location necessitating AMC manpower or equipment, it does not diminish the importance of the island airfield for AMC. Consequently, maintaining Wake Island as a key Coronet mission location represents a cost and safety risk avoidance for AMC.

#### 15. LOCATIONS REQUIRING CHANGES:

While much of this strategy uses existing infrastructure in its present configuration, the strategy does recommend enhancements and reductions around the globe. To better understand the recommended changes, we must first clearly understand today’s en route system as it’s structured in the tier definitions. The following table classifies each of today’s en routes locations with the most appropriate tier.

### **Today’s En Route System**

Tier I	Tier II	Tier III		Expeditionary	
Ramstein	Spangdahlem	Aviano	Singapore	Fairford	Ascension
Hickam	Rota	Cairo	Sigonella	Iwakuni	Antigua
	Mildenhall	Clark	Osan	Kandahar	U-Taphao
	Andersen	Misawa	Lajes	Bahrain	Christchurch
	Elmendorf	Moron	Diego Garcia	Djibouti	Balad
	Kadena	Tel Aviv		Souda Bay	
	Yokota	Richmond		Ali Al Salem	
	Incirlik	Kuwait		Bagram	
	Al Udeid	Eielson		Aruba	

(See the appendices for a complete list of en route locations including sites for which there is contract oversight.)

Now, given the proposed strategy, the en route system in 2025 would be structured as depicted in the following table:

## 2025 En Route System

Tier I	Tier II	Tier III	Expeditionary	
Ramstein	Spangdahlem	Mildenhall	Fairford	Singapore
Rota	Incirlik	Bagram	Christchurch	Saipan
Hickam	Al Udeid	Aviano	Kandahar	Lajes
	Sigonella	Djibouti	Papa, HGY	Cam Ranh
	Andersen	Eielson	Bahrain	
	Elmendorf	Misawa	Souda Bay	
	Iwakuni	Moron	Cairo West	
	Kadena	U-Taphao	Aruba	
	Yokota	Diego Garcia	Ascension	
	Kuwait-AI Mubarak	Richmond	Palanquero	
		Constanta	Antigua	
		Osan	Clark	
		Wake	Kuwait-Ali Al Salem	
		Kunsan		

In the Atlantic “Three-Use-Two” strategy the following highlights the proposed changes that will require dollars or manpower investment:

- Reduce Mildenhall to a Tier III location (an action already planned under the approved 21 EMTF Transformation Plan)
- Establish Bagram, Afghanistan, as a Tier III location; support USCENTCOM plans for strategic airlift ramp expansion and permanent infrastructure
- Expand ramp and fuels infrastructure at Ascension Island
- Invest in permanent infrastructure at Al Udeid
- Expand ramp and establish permanent infrastructure at Djibouti as a Tier III location
- Plus-up maintenance capability at Rota to elevate it to Tier I capability
- Establish Tier II capability at Sigonella
- Build wide-body capable ramp at Souda Bay
- Establish expeditionary capability at Papa, Hungary

The changes and required enhancements resulting from the Pacific “Two Route Plus” strategy are as follows:

- Stand up Tier II infrastructure at Iwakuni by expanding the airlift ramp and Material Handling Capability, but don’t man at Tier II capability (similar to Elmendorf)
- Establish Tier III capability at U-Taphao
- Establish expeditionary access and capability at Saipan

## **16. COMMERCIAL AIRLIFT**

Undeniably, our commercial partners provide a tremendous capability to our mobility system. Their role in carrying both cargo and passengers frees our organic fleet to carry the outsized cargo needed by the warfighter. Also, since user’s airlift requirements far exceed the capacity of the organic fleet, the commercial carriers are often able to help AMC fulfill its highest priority movements while providing the capacity to move lesser priority requirements. So, it would seem obvious, given the critical nature of commercial airlift, that the en route system should accommodate the commercial capability.

However, by agreement, the commercial carriers contracted to AMC only use military facilities under strictly controlled circumstances. For the most part, commercial carriers use civilian terminals of their choosing when possible. This is to their benefit, since it is far more likely for commercial terminals to have some maintenance capability for like aircraft. Additionally, commercial carriers require FAA-certified parts available at commercial airports.

## **17. KEYS TO SUCCESS:**

For a strategy to succeed, it must be implemented at the operational level, which implies occasional subordination of operational efficiencies to the greater strategic need and desired long-term effect. Among the things learned over the years is that if locations aren’t used, they will be lost, either to budget cutting measures or to host nation designs. For example, the closure of Zaragoza AB in Spain in 1996 by USAFE to meet budgetary constraints, and the Spanish decision in the same year to deny the US access to Torrejon AB. The natural inclination, for ease of operations and to minimize costs, is to consolidate operations in as few locations as possible. We see this inclination reflected in the fact that approximately 75 percent of today’s Atlantic operations flow through Ramstein AB. The notion is that even though the planners want the other locations for contingencies and surges, the fewer locations they have to plan to, the better. This, unfortunately, opens the other locations to scrutiny from those looking for budgetary savings today instead of looking at the strategy and needs of the future. Consequently, to secure access to locations required during contingencies or surges, we must be willing to operate in a distributed manner, even if this means a loss of day-to-day efficiency. This requires exercising the assets at those locations deemed necessary in the strategy. Should we not distribute our flow through all the en route locations and subsequently lose access to them, we have hindered our own ability to operate and have short-changed what the national defense expects of us.

To a large degree, any en route strategy will rely on the hospitality and support of regional services, MAJCOMs, and CCDRs. It is imperative that these services, MAJCOMs and

CCDRs agree with and support the strategy. Furthermore, the strategy should be shared with NATO for the purpose of coordination with NATO Capability Packages (CP). Should NATO see benefits for their CPs, the possibility exists for NATO funds to help secure some of the recommended enhancements. Consequently, it is crucial that this strategy be “taken on the road” to both inform and secure concurrence from the regional players.

The strategy will also involve Host Nation Notification to those nations where changes are being recommended. In some instances, host nation funding may be secured for some of the enhancements. In others, host nations are sensitive to changes in US military presence. A comprehensive diplomatic engagement strategy is necessary to ensure the ability to prosecute the strategy.

Access to many global locations will occur via commercial concerns. For example, South America and Africa, with little or no enduring US military presence, will rely on commercial airports to service AMC aircraft. AMC should support USTRANSCOM efforts to secure cooperative security location agreements with these and other countries and cooperative commercial contracts around the world.

Finally, the strategy cannot be static. It must adjust and adapt to changes in the National priorities, political landscape and fiscal constraints. To that end, we recommend that every two years, the command undertake a comprehensive review of the en route strategy. The results may be to continue with this strategy, an adjustment to these recommendations or a complete overhaul based on changing requirements.

## Appendix 1

### Existing Atlantic En Route Capabilities

Location	ICAO	WB Spots	NB Spots	Haz Cargo	WMOG (Mx)	Hydrants
Ramstein	ETAR	11	(and) 12	3	2 C-5/4 C-17	34
Spangdahlem	ETAD	13	-	2	3	13
Mildenhall	EGUN	4	(or) 8	1	1 C-5/2 C-17 (MRT only after 1 Oct 08)	9
Incirlik	LTAG	6	-	2	6	5
Al Udied	OTBH	2	12 (C-17s)	5	1 C-5/4 C-17	0
Bagram	OAIX	3	4		2 WB/4 NB	0
Rota	LERT	17	-	2	3	22
Moron	LEMO	18	-	2	MRT	34
Sigonella	LICZ	11	-	2	MRT	0
Aviano	LIPA	11	(or) 20	1	1	0
Souda Bay	LGSA	-	4		MRT	3
Lajes	LPLA	17	-	2	MRT	18
Ascension	FHAW	5	8		MRT	0
Djibouti	HDAM	1	1			
Kandahar	OAKN	-	2		2	0
Kuwait	OKAS	6	-	6	1	0
Al Mubarak	OKBK	6	6	1	N/A	0
Cairo West	HECW	3	4		MRT	0
Fairford	EGVA	5	25		0	

\* The 521 AMOW also provides oversight of contracts and air mobility operations at Fujairah, Tel Aviv, Naples, Bahrain, Jebel Ali, Manas and Ali Al Salem.

## Appendix 2

### Existing Pacific En Route Capabilities

Location	ICAO	WB Spots	NB Spots	Haz Cargo	WMOG (Mx)	Hydrants
Hickam	PHIK	5	15	4	6	18
Elmendorf	PAED	15	22	2	3(2)	20
Eielson	PAEI	8/16	60	15	1 w/TA assist	29
Yokota	RJTY	6	14	1	3	17
Misawa	RJSM	2	10	1	2	0
Iwakuni	RJOI	0	10	0	1	0
Kadena	RODN	4	8	2	2	6
Osan	RKSO	3	6	1	2	0
Andersen	PGUA	8	11	2	8	8
Kunsan/Kimhae	RKJK	2/1	4/2	1/0	1/1	0
U-Taphao	VTBU	7	18	2	N/A	7
Richmond	YSRI	1	3	1	1	1
Singapore	WSAP	3	8	1	1	0
Diego Garcia	FJDG	4	3	1	N/A	3
Clark	RPLC	4	10	2	N/A	0

\* The 515 AMOW also provides oversight of contracts and air mobility operations at Pago Pago, Fukuoka, Alice Springs, Atsugi, Don Muang, Jakarta, Kwajalein Atoll, Wake Island and Zamboanga.

### Appendix 3

#### Aerial Port Tier Classifications - 2025

Tier I	Tier II	Tier III		Expeditionary	
Ramstein	Yokota	Aviano	Singapore	Fairford	Ascension
Kuwait-Ali Mubarak <sup>1</sup>	Rota	Cairo	Sigonella	Balad	Antigua
	Kadena	Clark	Osan	Kandahar	U-Taphao
	Incirlik	Iwakuni <sup>5</sup>	Lajes <sup>6</sup>	Bahrain	Christchurch
	Al Udeid <sup>2</sup>	Moron	Elmendorf	Djibouti	Shannon
	Hickam <sup>3</sup>	Tel Aviv	Mildenhall <sup>6</sup>	Souda Bay	Kuwait-Ali Al Salem
	Andersen <sup>4</sup>	Richmond	Spangdahlem <sup>6</sup>	Ali Al Salem	
		Eielson	Misawa	Bagram	
		Diego Garcia		Aruba	

Notes:

1. Kuwait City provides inter-modal distribution between DDKS and the CENTCOM theater
2. Al Udeid serves as hub/spoke (trans-load) location for the CENTCOM theater
3. For aerial port purposes, maintain Hickam as Tier II with ability to expand to Tier I (inter-modal)
4. Establish Andersen as a Tier II aerial port capability to support trans-load operations, and expand to support inter-modal surface distribution
5. Iwakuni may need to expand rapidly to a Tier III aerial port capability as theater distribution strategy dictates (can support inter-modal surface operations)
6. Locations may need to expand rapidly to Tier III aerial port capability as theater distribution strategy dictates