

**REPORT OF THE DEFENSE
SCIENCE BOARD TASK FORCE
ON
STRATEGIC MOBILITY**



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AUGUST 1996

**OFFICE OF THE UNDER SECRETARY OF DEFENSE
FOR
ACQUISITION AND TECHNOLOGY**

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3 140 DEFENSE PENTAGON
WASHINGTON, DC 20301-3 140



9 Sep 96

MEMORANDUM FOR THE UNDER SECRETARY OF DEFENSE
(ACQUISITION AND TECHNOLOGY)

SUBJECT: Report of the 1996 Defense Science Board (DSB) Task Force on Strategic Mobility

I am pleased to forward the final report of the 1996 DSB Task Force on Strategic Mobility. This Task Force was co-Chaired by Larry Welch and Lee Baggett. The report responds to DOD's awareness that getting men and materials to the theater expeditiously and efficiently is critical to winning any type of armed conflict.

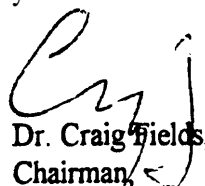
In developing their recommendations, the Task Force:

- Engaged in a broad review of strategic mobility, including a range of coalition scenarios
- Assessed how to minimize the "footprint" of deployed forces
- Assessed organizational responsibilities, especially on the "seam" between two organizations
- Assessed the process of flowing strategic mobility resources in support of a deployment
- Assessed the deployment planning and execution process, infrastructure, and information needs
- Assessed the strategic mobility resource activation process, including reserve call-up
- Assessed resources needed and planned to move forces, support and sustainment
- Assessed the Survivability and Protection of forces deploying to, and in-theater

The Task Force concluded that efforts should be focused on five major areas:

- Shaping the force for rapid response -- minimize the deployed footprint ashore
- Improving the deployment architecture, planning, infrastructure and flow
- Improving information system support for deployment planning and execution
- Improving the protection of the forces entering the theater
- Improving lift and prepositioning capabilities

I concur with the recommendations of the Task Force and recommend that you review the Chairmen's letter and the Recommendations Summary.


Dr. Craig Fields,
Chairman,
Defense Science Board





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MEMORANDUM FOR THE CHAIRMAN, DEFENSE SCIENCE BOARD

SUBJECT: Report of the 1996 Defense Science Board

Attached is the final report of the DSB Study on Strategic Mobility. In brief, our tasking was to engage in a broad review of strategic mobility under a range of scenarios. We examined the joint and service processes and resources for planning, executing, protecting, and sustaining force deployments. We also researched the resources and activities that provide command and control, communications and information systems in support of strategic mobility.

Our investigations led to the examination of five key broad challenges which must be met to efficiently and effectively fulfill the strategic mobility mission:

- Shaping the force for rapid response -- minimize the deployed force "footprint" ashore
- Improving deployment architecture, planning, infrastructure and flow
- Improving information system support for deployment planning and execution
- Improving the survivability and protection of the forces entering the theater
- Improving lift and prepositioning capabilities

Our principal findings and recommendations are summarized below:

Shaping the Force for Rapid Response: The post-Cold War military is rapidly adjusting to its new role as a CONUS-based, power projection force. A prerequisite for responsive strategic mobility capability is forces that are structured and equipped in accordance with this fundamental change in US strategy. During the cold war, forward deployed forces were expected to provide the initial US combat capability. We believe we must amplify the focus on shaping the force for rapid response by translating the Services 21st Century "how-to-fight" concepts and capabilities into more agile, deployable, and supportable force structure and support structure. We must add deployability as a key factor in evaluating systems and concepts, as we "flatten" and simplify deployed administrative organizations, and supporting initiatives for lean logistics and velocity management.

Deployment Architecture, Planning and Infrastructure and Flow: We need to continue to move towards a "seamless" force deployment and support structure that efficiently and effectively moves forces from the CONUS "fort" to the "foxhole" in theater. There is widespread recognition that while the Department has made improvements, it does not have a seamless capability to plan and execute the movement of forces from CONUS locations to tactical assembly areas in the theater. To alleviate this problem we need to address the deployment architecture, planning, infrastructure and flow. We are making good progress in fixing the "fort-to-port" and "port-to-port" movement through investment in force movement capabilities in the



CONUS and the procurement of C-17s, Large Medium Speed Roll-on/Roll-off (LMSR), Ready Reserve Force (RRF) and prepositioning programs. We now need to critically examine the theater Ports of Debarkation (PODs) to the foxhole portion of the process – a segment we believe is lagging behind the other segments in emphasis and investment.

Deployment Planning and Execution: At present there is a plethora of existing and emerging information programs to improve our capability to plan and control deployment. However, current efforts need a more coherent framework to extended to the next generation of information technologies. The many ongoing efforts to modernize information need a coherent management framework that facilitates fielding state-of-the-art transition systems to get connectivity now, while allowing transition to truly modern open architecture, flexible systems of the future. The move towards a seamless fort-to-foxhole information system would greatly benefit from a detailed simulation of the system and its operation.

Survivability and Protection of Forces: Far more attention is needed to protecting the forces entering and in the theater. For the most part, current deployment planning assumes a benign environment for the deployment phase of an operation. It is not useful to dwell on worst case assumptions and concerns that could paralyze planning and progress in developing and fielding the needed elements of strategic deployment. It is also not acceptable to assume away the consequences of clearly reasonable adversary motivations and attainable capabilities that could seriously disrupt the strategic mobility flow to and through the theater ports. The Task Force searched diligently for interest and actions in this area and was disappointed in the quality and quantity of both. There needs to be a greatly intensified focus on expanding Joint Warfare Capability Assessments (JWCAs), deployment feasibility work, exercises, etc., beginning with incorporating an assumption of hostile action against deployment operations, particularly at ports, into future exercises. The Task Force also emphasized the need to minimize the bottleneck of exposed forces and materiel at vulnerable ports.

Lift and Prepositioning: The strategic mobility triad consists of airlift, sealift and pre-positioned forces. For all but the smallest contingencies, the bulk of the forces and equipment will move by sea from the CONUS (or from Europe). Each leg of this strategic mobility triad is vital to support National Military Strategy. There is a need to continue strong support of approved lift and prepositioning capability programs. Additionally, programs like the Joint Logistics-Over-the-Shore for Sea State 3 should be accelerated. Also, more attention needs to be paid to the numerous challenges in moving and handling ammunition.

We recognize that further improving the nation's Strategic Mobility is a large undertaking involving many organizations. We also believe that by focusing on the areas mentioned above, the critical movement of men and materials to conflict will be more effective, efficient, timely and less costly, while meeting the needs of warfighting CINCs. The Department clearly has the means to address this challenge.


Larry Welch, General, USAF(Ret)


Lee Baggett, Admiral, USN(Ret)

Defense Science Board
Strategic Mobility Task Force
Final Report

31 August 1996

Table Of Contents

Charter	3
Task Force Participants.....	4
Background.. ..	6
Executive Summary.. ..	12
Issue Areas & Recommendations	
(1) Minimizing the Deployed Footprint..	15
(2)Deployment Architecture, Planning, Infrastructure & Flow.....	26
(3) Information Systems Support to Deployment Planning & Execution ..	42
(4) Protecting the Forces Entering and In the Theater.....	52
(5) Lift and Prepositioning Capabilities .	63
The Top Five	83
Acronyms.....	84

Task Force Charter

- **Engage in a broad review of strategic mobility. include a range of coalition scenarios**
 - Major Regional Contingencies (MRCs)
 - Lesser Regional Contingencies (LRCs)
 - Operations Other Than War (OOTW)
- **Minimizing force footprint in the theater**
- **Organization and responsibilities**
- **Mobility flow process - moving seamlessly**
- **Deployment planning and execution process, infrastructure, and information needs**
- **Strategic mobility activation process --reserve call-up**
- **Resources to move forces, support and sustainment - lift, prepositioning, and port clearance**
- **Survivability**

The Task Force was asked to do a broad review of strategic mobility, to include a range of scenarios. The Task Force considered

Major Regional Contingencies (MRCs)
Lesser Regional Contingencies (LRCs)
Operations Other Than War (OOTW).

While some of the strategic mobility challenges are similar across the range of contingencies, there are also important differences. One, in particular is the range of threats to strategic mobility, particularly during future major contingencies. Planning must account for the likelihood of adversaries with both capability and motivation to delay, disrupt, and otherwise raise the price of entry into the theater.

Regarding reserve forces issues, the Task Force found most to be related to force structure and force integration rather than strategic mobility. There continue to be issues associated with reserve forces call-up, but these have been addressed elsewhere.

The Task Force

The Sponsors

- **USTRANSCOM**
- **Director, Strategic & Tactical Systems, OUSD(A&T)**

Members

- | | |
|---------------------------------|--|
| - Lee Baggett - Co-Chair | - Jim McCarthy |
| - Larry Welch -Co-Chair | - Milt Minneman |
| - Norm Betaque | - Bob RisCassi |
| - Joe Braddock | - Chuck Stanley |
| - Ted Gold | - Jack Woodmansee |
| - Dennis Hall | - Keith Larson - DSB |
| - Mike Kalleres | - Chris DiPetto - Exec. Secretary |
| - Dave Kassiaq | - Bud Vazquez - Exec. Secretary |
| - Jerry King | |

4

The Task Force membership provided a mix of operational and technical experience and expertise.

Task Force Government Advisors

- | | | |
|-----------------------|---|------------------------------------|
| - Maj Gen Bill Begert | - | USTRANSCOM/TCJ-3/4 |
| - Maj Gen Bobby Floyd | - | HQ USAF Forces Directorate |
| - Mr. Jim Johnson | - | OSD Program Analysis & Evaluation |
| - Col Dave Ellison | - | HQ Defense Logistics Agency |
| - Col Jim Etzel | - | Joint Staff Mobility Division, J-4 |
| - Cnpt Lee Harris | - | HQ US Navy, OPNAV-4 |
| - Mr. Chris Thayer | - | Military Sealift Command |
| - LtCol Mike DeMayo | - | HQ US Army |
| - LtCol Larry Romaine | - | HQ US Marine Corps |
| - LtCol Rick Pilling | - | OSD Transportation Policy |
| - Mr. Charlie Stuart | - | DARPA |
| - Dr. Paris Genalis | - | OSD Naval Warfare Branch |

5

The Task Force was extraordinarily well supported by knowledgeable government advisors.

The Key Broad Challenges

- **Shaping the force for rapid response - minimizing the deployed footprint ashore**
- **Deployment architecture, planning, infrastructure and flow**
- **Information system support for deployment planning and execution**
- **Protecting the forces entering the theater**
- **Lift and prepositioning capabilities**

The report will address the strategic mobility challenges in the five areas shown here.

A prerequisite for responsive strategic mobility is having forces that are structured and equipped with attention to a fundamental change in US strategy. During the cold war, in-place forces were expected to provide the initial US combat capability. Today, the US relies on a smaller overseas presence to meet its regional security requirements. The continuing need for heavy division force package capabilities that must now be deployed in a crisis to deter or defeat regional adversaries should have a fundamental impact on the structure of the force.

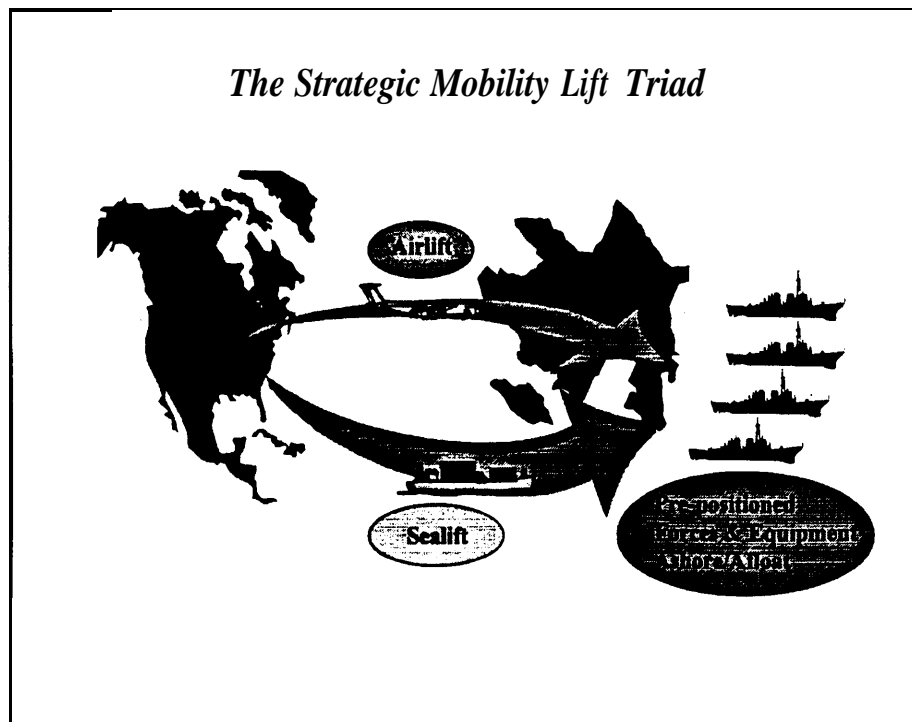
There is widespread recognition that the Department needs, but does not have, a seamless capability to plan and execute the movement of forces from CONUS locations to tactical assembly areas in the theater.

At present there are many existing and developing information systems programs to improve the ability to plan and control deployment. However, current efforts need a more coherent framework, and plans need to be extended to the next generation of technologies.

Far more attention needs to be directed at the protection of forces entering the theater after the initiation of conflict. For the most part, deployment planning assumes a benign environment for the deployment phase of an operation.

The needed lift and prepositioning programs face multiple budget exercises, congresses, and administrations, and will need robust continuing support.

The Strategic Mobility Lift Triad



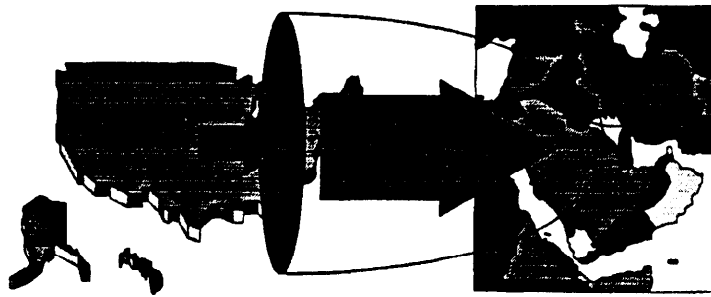
The mix of airlift, sealift and pre-positioned forces and materiel will depend on the contingency. Airlift will play heavily in the vital leading edge of virtually any contingency, and will be a major people mover.

Marine Expeditionary Forces afloat and pre-positioned equipment will play a primary role in all major contingencies and in many lesser ones.

For all but the smallest contingencies, the bulk of the forces and equipment will move by sea from the CONUS (or from Europe).

Each leg of this strategic lift triad is vital to support of the National Military Strategy. During the course of this Task Force, attention increasingly focused on the fort-to-foxhole movement of Army forces from CONUS since this task needs the greatest increased attention.

*The Strategic Bottleneck
Ports of Debarkation
both Air & Sea*



Fort-to-Port-to-Port-to-Foxhole

While each phase of deployment planning and execution requires intense coordination and ongoing attention, the greatest increased need is in the fort-to-foxhole phase.

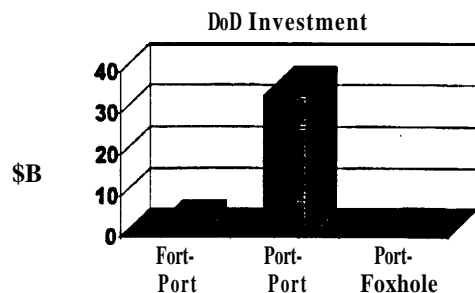
The clear and continuing bottleneck in deployments to locations other than Central Europe is the flow through theater air and seaports of debarkation. It seems logical, therefore, that this bottleneck would receive the most intense focus.

The Task Force found that not to be the case for a number of reasons. For one, transportation professionals, including the US Transportation Command, are responsible for movement from CONUS locations to the theater ports of debarkation, while theater commanders are responsible for movement through the ports to the tactical assembly areas. Further, the port-to-foxhole movement requires extensive host nation support, which is often difficult to nail down in advanced planning and training.

In addition, there is an early bulge in the CONUS fort-to-port phase beginning in the first 5 to 7 days at CONUS Ports of Embarkation. There is also continuing focus on addressing this issue.

Strategic Mobility - Challenge & Response

- MRC-1 requires theater reception pace three times Desert Shield pace
- Investment balance



Need to sustain the attention to Fort-Port and Port-Port
Need far more intense attention to Port-Foxhole

This chart indicates the mismatch between investment and the shortfalls in the port-to-foxfhole phase of deployment.

Investments in better planning, physical capabilities and training are addressing important fort-to-port needs.

The \$34+ billion investment in pre-positioning and strategic lift will, by about 2003, meet the 2 MRC requirement. If these programs stay on track, strategic lift capabilities will support the war plans, with the exception of ammunition transportation. There is still insufficient organic or commercial lift to meet the surge ammunition needs in the first 45 days of conflict.

The most obvious shortfall is the low investment in port-to-foxfhole needs. There are a variety of reasons for this continuing shortfall. We need a seamless, joint strategic mobility concept of operations that drives investment. Such a concept would quickly focus attention on this bottleneck. We also need recognition that this phase of deployment is the one most subject to disruption by the adversary, and it must therefore receive the most support.

Other Implications of the Bottleneck



This picture dramatically illustrates a key implication of any bottleneck or poor staging planning at ports in areas subject to enemy action.

The munitions shown were being staged for US and British forces. The USS Tarawa is at the pier. The implications for the port and sea lift assets are obvious.

The Planning Mismatch ***Operational Planning vs. Mobility Planning***

Just-in-Case Operational Force Planning, optimizing:

- . Dominant force effectiveness ashore
- . Ammunition & other supply stocks in-theater
- . Combat service support ashore

Best Case Strategic Mobility Planning, assuming:

- . Benign deployment environment
 - Threat action
 - Weather
- . Maximum flow through ports
- . Host nation support
- . In-theater infrastructure

- . Reconciling the mismatch between force planning and mobility realities:
 - . Cold war – fall back on nuclear weapons as the shock absorber
 - . Desert Storm – stretch the response time until force goals satisfied
 - . Future MRC – balance operational and strategic mobility planning

The Task Force found a basic mismatch between attitudes regarding combat operations and mobility planning. Combat force and combat support planners assume a highly capable opponent who is likely to take advantage of any weaknesses in our forces or support. Forces and support are planned to ensure dominance even in the face of a smart, determined opponent.

In contrast, mobility planning tends to ignore even obvious threat capabilities to disrupt the mobility flow. War plans are based on the most optimistic assumptions about flow through the ports, host nation support and in-theater infrastructure to move forces and materiel from ports to tactical assembly areas.

In the past, this mismatch was addressed in a variety of ways, with two examples shown here. However, the current National Military Strategy demands that strategic mobility planning take more realistic account of threat capabilities. The demand for more robust mobility capabilities may demand some trade-off in combat forces and support ashore to be responsive to the contingency situation.

Executive Summary

Where To Focus

Shape the force for rapid response

- Translating the Services' 21st Century how-to-fight concepts and capabilities into more agile, deployable combat and support forces
- Adding deployability and agility as key factors in evaluating systems and concepts
- Supporting initiatives for lean logistics and velocity management
- **Deployment Architecture, Planning, Infrastructure and Flow**
 - Progress in fixing fort-to-port but first 5 days critical
 - Port-to-port - movement to theater PODs - C-17, Large Medium Speed Roll-on/Roll-off (LMSR), Ready Reserve Force (RRF), pre-positioning programs, and enroute airlift infrastructure.
 - Improving port of debarkation throughput (port-to-foxhole) - lagging behind
 - Need seamless force and support deployment system and process
 - Need improved systems for execution in addition to deliberate planning systems

12

Those perspectives led the Task Force to focus most intensely on the areas shown in this and the next two slides.

The Task Force did not attempt, and found no need, to invent new operational concepts to make forces more agile, adaptable and deployable. The Services are putting thought and energy into doing that, and bold concepts are currently being evaluated. The task now is to craft force structures and support concepts that go with these bold concepts.

As to deployment flow, the emphasis clearly needs to be on the bottlenecks in mobility flow - the first five days of receipt and loading at ports of embarkation and movement through theater ports to tactical assembly areas. That will require that, in addition to increased attention to physical capabilities, the plethora of current plans, programs, and organizations for deployment planning and execution come together to support a coherent joint deployment doctrine in a seamless manner.

Executive Summary
Where to Focus (cont'd)

- Information system support for deployment planning and execution
 - Need fort-to-foxhole information system - include a detailed simulation of the system and its operation
 - Need a coherent management framework for the many ongoing efforts to modernize information that facilitates:
 - Fielding state-of-the-art, near-term transition systems to get connectivity now
 - Transition to truly modern open architecture, flexible systems
- Protecting the forces entering the theater
 - Needs greatly intensified focus
 - Expand Joint Warfare Capability Assessments (JWCAs), deployment feasibility work, exercises, etc., addressing hostile action against deployment operations - particularly at ports
 - Need to minimize pile up of exposed forces and materiel at vulnerable nodes
 - Need realistic assessments of the near-term and long-term threat

13

Modern information systems are essential to a timely, seamless flow, and a rich menu of technology and information concepts is available and being pursued. What seems most needed is coherent direction for the interim systems and planning for the more robust, more flexible next generation systems.

It is not useful to dwell on worst case assumptions and concerns that could paralyze planning and progress in developing and fielding the needed elements of strategic deployment. It is also not acceptable to “assume away” the consequences of reasonable adversary motivations and attainable capabilities that could seriously disrupt the mobility flow to and through the theater ports. The Task Force searched diligently for interest and action in this area and was disappointed in the quality and quantity of what was found.

Executive Summary
Where to Focus (cont'd)

- **Lift and prepositioning capabilities**
 - Continue strong support of approved programs through multiple congresses, administrations, budget exercises, etc.
 - Need to accelerate the program for Sea State 3 Logistics-Over-the-Shore capabilities
 - Attention to numerous challenges in moving and handling ammunition

14

Current programs will, if carried to completion, provide the needed port-to-port lift.

However, deployments are heavily dependent on large, modern ports. More attention is needed on over-the-shore capabilities to supplement established ports and to reduce vulnerability to disruption.

As noted later in this report, ammunition handling capability through the ports and in the theater needs much attention.

***Shape the Force for Rapid Response
Minimize the Deployed Footprint***

We turn now to the first area of concern – shaping the force with attention to the need to deploy thousands of miles. A key to success is minimizing the footprint of the forces to be deployed ashore.

*“An army is efficient for action and motion in the
inverse proportion to its impediments”*

— General William Tecumseh Sherman
Memoirs

Reducing the required footprint ashore increases
agility and deployability and decreases susceptibility
to hostile action against critical deployment nodes.

As is evident from the wisdom of General Sherman, the value of agility, adaptability, and deployability from garrison is not a new idea. Even in the Civil War era, mobility of forces was a daunting task.

Today, there are additional reasons to minimize what we take to future contingencies. The potential of enemy action against US forces, particularly as they arrive in theater, requires that the footprint of the forces be kept to the absolute minimum consistent with the mission of the forces. In particular, supporting forces should be designed and managed to maximize the contributions they make to combat power per unit of footprint ashore.

The Footprint Issue
Major Regional Contingency

% of Dry Cargo Weight			
<u>Army</u>	<u>Air Force</u>	<u>Navy</u>	<u>Marine Corps</u>
77	10	6	8
Army Unit Equipment (TAA 03)			
	<u>Tonnage (000 ST)</u>	<u>Shipping (000 Sq Ft)</u>	
Combat	663 (41%)	11,912 (32%)	
CombatSupport	174 (11%)	4,492 (12%)	
Com batServiceSupport(CSS)	790 (48%)	20,478 (56%)	

17

In this section, much of the focus will be on the ground forces, and most of that will be on Army forces. This is not because other forces do not need improved deployability. But the demand associated with Army forces is dominant.

Contingency plans and programs reflect the phased nature of major regional contingency operational concepts. Prepositioned and early deploying units from all the Services supplement forward based capabilities to halt invasions and prepare for the reception of decisive force packages.

Army forces generate 77 percent of the total strategic mobility workload and an even higher proportion of the forces transported for the later phases of an MRC. These Army deployments are dominated by Combat Service Support units and reflect OPLAN driven, time-phased sustainment requirements for all Services.

New warfighting capabilities and concepts are evolving that may offer a higher degree of battlefield dominance across battlefield operating systems. Such improved capabilities suggest equally bold, new service support concepts that might sharply tailor the deployed force footprint.

***Growth of the Army Footprint -1989 - 1994
Combat Forces***

<u>Division</u>	<u>Growth in Unit TO&E Weight</u>	<u>Total Unit Weight (000 STONs)</u>
Armored	46 %	110
Mechanized	49	109
Infantry	31	68
Air Assault	42	36
Airborne	67	27
Light Infantry	35	17

Cold war plans coming to fruition in post-cold war forces
with heavier forces for deployment from the CONUS

18

Major Army combat units grow almost 50 percent in deployment weight (one important measure of deployability) following the end of the cold war. While the Task Force did not attempt to evaluate the reasons for this phenomenon, it is clear that, in structuring and equipping Army units, the need for global agility has played second fiddle to the quest for overmatching combat power. Since the end of the cold war, as the Army divisions combat power has been increased to achieve an overmatching lethality, every type of Army division has grown substantially in deployment weight with obvious implications for mobility.

Some Relevant Ground Force Concepts

- Multiple efforts: Army After Next, Marine Corps Operational Maneuver From the Sea (OMFMS), Sea Dragon, DARPA Small Unit Operations work
- Common themes
 - Rapid, flexible, modular force tailoring
 - Fewer echelons of admin headquarters -virtual combat unit organization
 - Dispersed forces - lighter, higher tempo forces controlling larger battle space with fewer forces
 - Shared battlefield awareness and decisions at the lowest informed level
 - Increasing receptivity to enabling technologies
 - Position location and information systems for the individual
 - Precise target location, designation and lethal weapons
 - Non line-of-sight, wireless communications
 - Robotics & unmanned systems
 - Minimize combat support and combat service support ashore in the theater
 - More reliance on indirect fires

Need attention to evolving force structure and support concept to operational concepts

Emerging ground force concepts appear to be moving in directions matching the national military strategy for meeting contingencies. The Army has published its Force XXI concept and is working the Army After Next concept. The Marine Corps implementation of Operational Maneuver from the Sea is embodied in the Sea Dragon Advanced Concept Technology Demonstration (ACTD). The DARPA Small Unit Operations concept supports both Services' concepts.

Some common themes are shown here. As these concepts mature, they should lead to greater agility, flexibility and reduced deployment footprint ashore.

Near Term Initiative Supporting New Force Concepts

Evolving force structure and support concepts will take time, but we need to get started now on:

- Building faith in timely delivery of support and sustainment
 - Robust information systems
 - Responsive transportation
- Leveraging fundamental new capabilities to provide shared full battlefield awareness
 - Global Broadcast Service and Warfighter's Associates technologies
 - Ensure relevant information at multiple local levels
 - Accessible on demand and on the move
 - Tailored information vs. fused
 - Build confidence in information systems and information flow
 - Eliminate reluctance to share information and decision making across echelons

For commanders to accept leaner, more agile, lower footprint support concepts, the logistics community will have to provide high confidence in timely sustainment. That will require information systems with the right information, assured access and robustness. It will also require reliable, responsive transportation and assured allocation of transportation to sustainment.

Virtually all the new warfighting concepts for all the Services also assume a far richer picture of the battlefield. At present, there is almost a "Tower of Babel" aspect to developments in this area. The task force found a multiplicity of developments and concepts and ways of thinking about the problem. While there are several ongoing efforts in the department to bring coherence, the search for coherence obviously must go on.

Approaches to Reducing Footprint at the PODs

- Doctrine emphasizing rapid port clearance
- Maximize use of multiple PODs and Logistics Over the Shore (LOTS)
- Rapid port clearance capabilities early in the Time Phased Force Deployment Data (TPFDD)
- Improved coordination of personnel and equipment flows
 - Smooth out peaks and valleys in TPFDD flows
 - Unit integrity in ships at least at the company level, preferably at battalion
 - Accurate advance notice to reception units
- Improve force tracking information systems
- Train and exercise

While footprint is an important general issue, not all footprints are equal in importance. From a strategic mobility viewpoint, the most critical need is to reduce the day to day footprint at the PODs.

The first step is to declare that maximum throughput and minimum pile up at the PODs has both important combat build-up and vulnerability implications. There is significant anecdotal evidence that while throughput was an important consideration in past deployments, doctrine, organizational and physical changes are needed to make minimum pile-up a reality.

Moving away from relying on a minimum number of ports will require added investment in port clearance and logistics over the shore. However, the payoff will be in more throughput, lower vulnerability and more robust capability at the point where such robustness is the most important.

Further, a shortsighted response to the theater commander's natural desire for the most combat capability early in the deployment can quickly have the opposite effect. Port clearance capability has to receive near top billing in the initial flow if there is to be effective initial use and eventual efficient use of ports.

Planning and execution tools to better match people and equipment flows can be readily available, and much work to provide them is underway. The plethora of such efforts and the need for more coherent planning will be discussed later in the presentation.

And finally, the best laid plans are only plans. Capability comes from people who know how to carry out plans.

Four Imperatives in Shaping the Force for Rapid Response

- Focus management attention on deployability and footprint as a design and operating concept
- Support technologies and initiatives that offer reduced footprint
- Take a long-term view
- Maximize the combat contributions per unit of support footprint deployed

To shape its forces for rapid response and reduce the deployment footprint at risk in major contingencies requires a fundamental shift from Cold War strategic mobility thinking.

The likelihood of success in **making** this shift depends on continuing attention by DoD leaders and enduring support for systems technologies, and organizational initiatives that create a rapidly deployable and effective combat force.

There are two other general considerations:

- Success will not come quickly since budgets are limited and inherited systems will dominate force structure.
- Reductions in the footprint of support units should be guided by the principle of maximizing combat capabilities ashore.

Some Positive Trends Requiring Continuing Emphasis

Footprint is a recently emphasized concern and needs continuing reinforcement

- Support Lean Logistics and Velocity Management initiatives
 - Extend the idea to munitions and other high volume cargo
- Require the Services to measure, manage, and report footprint in force evaluations and TPFDD development
- Develop and apply constraints on unit deployment size, and allow CINCs and Services to make trade-offs within them
- Use footprint criteria in Defense Guidance, Defense Acquisition Board (DAB) deliberations, POM reviews, mobility studies, Joint Warfare Capability Assessments (JWCAs), etc.
- Provide incentives for footprint reduction programs
- Emphasize advanced planning for Host Nation Support

The force will not be shaped for rapid response unless continuing attention is paid to the specifics of this goal. The benefits from reduced footprint are also clear and specific.

During the Cold War, strategic mobility was of less concern than other considerations in structuring forces. The “10 division in 10 days” concept was partially met by large forces stationed or prepositioned in Europe. Host nation support was well organized and structured.

Restructuring forces for rapid response to varied, unpredictable contingencies calls for measuring responsiveness and footprints in force, and operational planning for unit deployments and sustainment operations. Responsiveness and footprint effects should become basic criteria for making force structure and support concept decisions.

*Some Positive Trends Requiring Continuing Emphasis
(cont'dd)*

- Ground force efforts to produce 21st century concepts leveraging 21st century capabilities could enable major footprint reductions
 - Survivable light force units with high lethality long-range munitions
 - Battlefield information systems to control firepower
- Technologies and initiatives aimed at reducing footprint of maneuver forces
 - Easily tailored, modular force packaging
 - Enabling technologies for dispersed small unit operations
 - Enhanced indirect fire capabilities
- Means to reduce combat service support footprint
 - Provide combat service support from afar
 - Flatten and simplify deployed administrative organizations
 - Extend Logistics-Over-the-Shore (LOTS)
 - Fund “enablers” for velocity management and lean logistics

The Task Force has not addressed the technical and operational details of the newly emerging Army and Marine Corps concepts for the 21st century. Still, it is clear these initiatives could lead to greatly enhanced capabilities in smaller, more responsive, and more sustainable forces – combat capabilities with a smaller footprint.

Other ongoing programs will reduce the footprint that US combat and combat service support forces would deploy. The initiatives listed are all being supported but merit further emphasis.

Areas Needing Significant Further Improvement

- Match new warfighting concepts with support concepts that leverage information to minimize cargo that must flow through the ports [CJCS, Army, Marine Corps]
 - Long range fire systems, afloat and ashore
 - Air and sea systems for reliable and accurate delivery of supplies
- Doctrine and concepts for minimizing footprint at PODs [CJCS]
- Information and distribution systems that warfighters will trust to provide reliable and responsive logistics support from afar [USD(A&T), ASD/C3I, J-6, J-4]

8

Combat service support planning tends to lag combat force development more than necessary. There is a clear need to accelerate and expand support concepts that leverage improved information systems and new warfighting concepts to minimize the combat support and combat service support units that must be deployed ashore in major contingencies. Many of the needed technologies are available; they need to be melded into a system that reliably supports the new warfighting concepts.

The lack of Service and Joint doctrine is a major issue. This is particularly important for seaports and airfields, where cargo tends to pile up and valuable ships and aircraft are at risk.

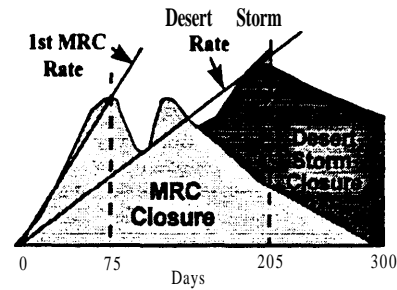
Building a sustainment system that warfighters trust is a key step. Confidence in resupply system performance can be expected to lead to reductions in requirements for massive materiel stockpiles ashore in the contingency area. The first step is to make someone responsible for resupply operations. The second is to provide the resources - bandwidth, information, decision aids, and distribution capabilities - to do the job. Finally, the resupply system performance should be monitored continuously and problems identified fixed quickly.

*Deployment Architecture, Planning,
Infrastructure, and Flow*

The preceding discussion has emphasized the challenge of coherent deployment planning and execution. This section will expand on that subject.

Mobility Requirements Study Bottom-Up Review Update (MRS BURU)

- 2001 time frame
- MRC-1 requires corps size forces and support in place in 75 days versus 205 days in Desert Shield-- a new level of deployment efficiency



Making US forces effective in controlling events will require unprecedented deployment flow efficiency

21

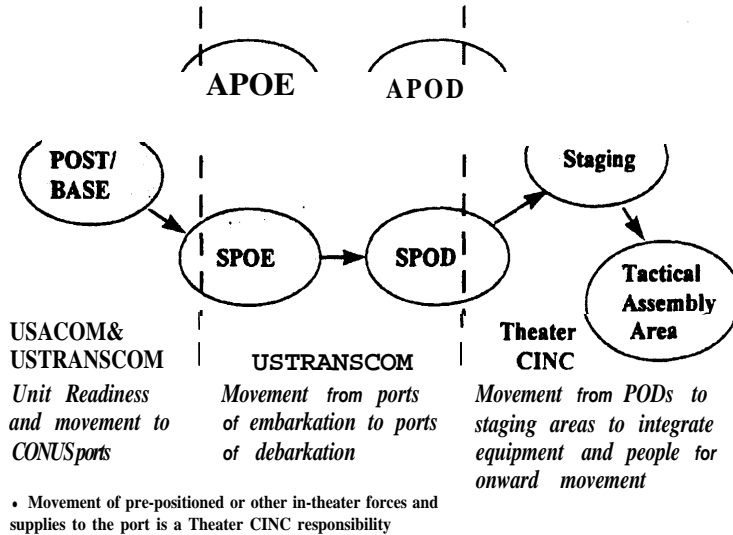
The underlying basis for strategic mobility requirements - the 2 MRC strategy that grew out of the Bottoms-Up Review-was updated in MRS BURU with a baseline planning date of 2001.

The update accounts for program plan changes and validates sealift requirements.

Other work and DoD decisions updated and validated the need for 120 C-17s and airborne tanker support.

The basic strategic mobility planning and execution task is to have the MRC-1 force in place within 75 days with flow to MRC-2 beginning at day 45. This will require a pace of force buildup in the theater 2.5 to 3 times greater than achieved in Desert Storm. There is clearly no room for inefficient management of the flow.

Deployment Flow Responsibilities and Seams



Deployment flow responsibilities are in three major segments.

The Theater CINC identifies the forces required for the mission.

The selection of units for deployment, their readiness to move, and their movement in the CONUS from posts and bases to air ports and seaports of embarkation is the responsibility of USACOM and its component commands.

Units plan, arrange and execute their own movements, securing rail or truck transportation through Military Traffic Management Command, and coordinating port arrival with Air Mobility Command or MTMC.

The strategic transportation segment, from port of embarkation to port of debarkation, is planned and executed by USTRANSCOM.

Movement within the theater of operations, from the ports of debarkation, to staging areas for marry up of equipment and personnel, to tactical assembly areas, is the responsibility of the Theater CINC.

Developing a Deployment Plan
A Complex Multi-Agency Deliberate Planning Process

- Theater CINC specifies combat forces needed for a mission and the need dates for arrival of forces in theater
- Component commands specify combat support and combat service support forces and resupply
- US Transportation Command assesses transportation feasibility of the deployment plan
- US Atlantic Command "sources" units -- designates specific units to be assigned
- Theater CINC validates TPFDD
- Theater CINC plans reception, staging, onward movement and integration

A complex planning task that must adjust quickly to unfolding events

Deployment planning is a complex, iterative process involving many players, all supporting the CINC's planning effort.

The CINC specifies the numbers and types of combat units needed for an operation and the time phased arrival needs for those forces in theater.

The Service components specify the types and numbers of combat support and combat service support units needed.

USACOM identifies the specific units to satisfy notional requirements.

USTRANSCOM assesses the transportation feasibility of the plan.

As planning progresses, force composition and unit arrival dates are adjusted until the CINC is satisfied that an acceptable balance exists between transportation capability and force closure.

The result of the planning is documented as Time Phased Force Deployment Data (TPFDD).

Deliberate Planning Process

- 16 • 24 month process
- Three 100+ page OPLANs and numerous CONPLANs
- Valuable for knowledge it builds and documents about:
 - Potential adversary
 - Theater of operations
 - Forces available
 - Resource constraints
 - Process, procedures and interfaces
 - Timing
- Provides a starting point for dealing with a contingency, but
 - Actual use requires substantial, time consuming, modification
 - Crisis action planners rarely were involved in deliberate planning

A process that continues to evolve and improve but . . .
The skilled expertise and focus on planning tools developed
for deliberate planning are not leveraged for crisis execution

Much of the deployment planning is an integral part of the deliberate planning process used for contingency planning.

Deliberate planning is a well defined process for generating the myriad of details that constitute a fully developed military operations plan. For a major operation, such planning typically takes 16 to 24 months and involves hundreds of planners throughout the DoD.

In the past several years, deliberate planning has produced three operations plans and numerous concept plans.

Dealing with a specific threat and a CINC's concept for dealing with that threat through deliberate planning generates a wealth of information about the threat, the operating environment, the resources needed to conduct the operation, how to accomplish the military tasks, timing, etc.

Still, despite the effort devoted to them, deliberate plans can never fully meet the real needs of an unfolding military operation. Crisis action planning is always required.

Time Phased Force Deployment Data (TPFDD)
Process Reflects Deliberate Planning Strengths

- TPFDD (or the equivalent) essential to transportation planning and scheduling
 - Identify units, their origins, destinations, and movement priorities
- Produces a baseline "transportation feasible" TPFDD
 - Brings together many participants, resolves conflicts in objectives, priorities, and resources
 - There is a continually evolving suite of tools to support TPFDD development-Joint Flow and Analysis System for Transportation (JFAST)

The process for creating a TPFDD as part of deliberate planning reflects the strengths and weaknesses of that process.

It brings together the entire community of planners to devise a transportation plan that is both feasible and satisfactory to the CINC. In addition, it has spawned creation of a set of constantly improving transportation planning tools.

Time Phased Force Deployment Data (TPFDD)

Process Reflects Deliberate Planning Weaknesses

- . **TPFDDs born of lengthy deliberate planning**
 - May be useful for the first few days of deployment to start the flow but. . .
 - . Requires substantial and continual change during crisis execution
 - . Do not adequately deal with port-to-foxhole
 - . Done by planners while execution done by operators
- . **Recent deployments suffered from:**
 - inaccurate data on the movement characteristics of units
 - Late arrival of units at ports of embarkation
 - Piecemeal planning of CONUS, intertheater, and intratheater portions of the deployment

In execution, a TPFDD resulting from the deliberate planning process can meet the needs of a crisis only as well as the underlying plan allows. Even if the detailed deployment planning proves valuable in starting the flow of forces, a TPFDD will require substantial and continual change during execution.

Recent deployments offer a sampling of the challenges; inaccurate unit movement data, units unprepared for deployment on the planned schedule, mismatches between the three major segments of deployment flow, and inability of the CINC to monitor and control the flow.

Today's capabilities for planning the flow of forces, assessing the implications of deviations from plans, replanning, and redirecting deployment operations do not meet operational needs. Crisis execution requires a set of highly responsive tools specifically designed for fast paced, rapidly changing deployment operations.

Crisis Response Execution

- Apply deliberate planning expertise to crisis response deployment planning
- Modularize forces for deployment planning and execution to facilitate rapid replanning and execution
- Develop information systems **and** planning tools specifically designed to facilitate crisis execution
- Train and exercise force modules through the tactical assembly or mission assignment phase using the same planning and command and control systems used for actual deployments
- The Joint Staff and theater CINCs need increased emphasis on concepts, doctrines and information systems that optimize deployability and build-up of capability in the theater in crisis situations

Deliberate planning and crisis response execution replanning have been carried out historically by different staff organizations. Lessons learned are not well tracked and used in either or both deliberate planning or crisis execution. The deliberate planning process develops functional expertise that should be applied to crisis replanning and execution.

With forces modularized for deployment, unit response actions will be far more predictable and constant from crisis to crisis. However, the rapid replanning demands common to crisis execution will require a set of tools specifically tailored to that need.

Forces modularized for deployment provide theater CINCs the needed flexibility to adjust the flow to the real life demands of individual situations. These modules could include air defense batteries, port opening packages and various size maneuver forces, combat support packages, etc. The concept is not to reorganize the combat force but to package the forces and support with intense attention to the greatly increased importance of getting the forces to the crisis quickly in a ready to employ condition.

The unit training for these modules needs to place intense emphasis on deployment as well as employment. The training should include the transition phase from arrival at the APOD/SPOD through the tactical assembly area or the organizational phase for noncombat crisis response.

The Joint Staff and theater CINCs need to emphasize concepts of operation and doctrine that clearly define responsibilities and procedures for deployment execution.

Critical Information Deficiencies

Theater CINCs lack timely information

- To monitor and control the flow of forces
- To balance the efficient use of transport with the urgency of building combat power to assess the implications of changes in movement priorities
- To selectively identify and give priority to movement of urgently needed, but less than full unit capabilities.

Crisis Execution requires a set of planning tools specifically designed for responsive and reactive planning on the fly.

Beyond the weaknesses of the current deployment planning and execution process, CINCs lack the timely information they need to adjust the flow of forces to meet a changing tactical situation. Though they plan and initiate the deployment, they have little information to monitor and control its progress. They can and do change priorities, but information exchange is largely via telephone with little ability to assess the full implications of actions or alternatives. Efficient use of transportation assets becomes a goal in itself, with inadequate ability to balance its use against priorities for building combat capability in theater.

Though units are now conducting deployment exercises, response to contingencies is likely to call for deployment initially of only portions of some urgently needed units, e.g., an advance party, a port opening team, or an air defense battery. The CINC needs movement information in the kind of detail that would include these minimum capability force modules. He also needs assurance they are exercised in deployment.

Crisis Planning/Execution Needs Dynamic Tools

Dynamic process requires models, simulations, decision support aids and information systems and trained personnel for:

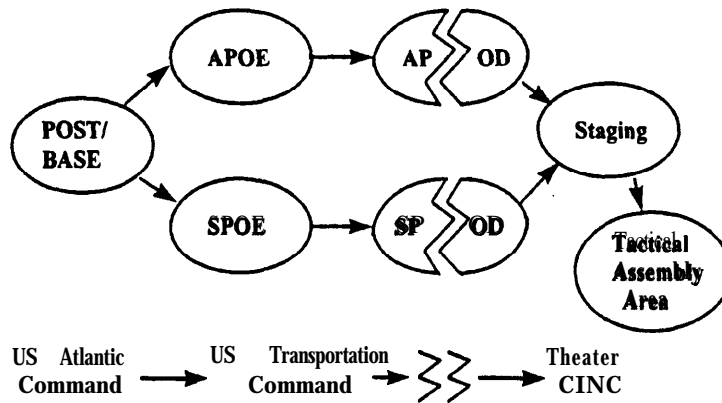
- Rapid course of action assessment - impact of decisions on force flow and combat effectiveness ashore
- Seamless, origin (post or base) to destination (tactical assembly area) planning and execution
- Translating decisions into plans and direction
- Continuous monitoring of execution
- Feedback on critical deviations from plans
- Projecting current operations and plans into the future
- Frequent iteration of the entire process

Here we characterize the dynamic tools needed for crisis planning and execution.

What distinguishes them from today's tools is their focus on current or near future operation, providing almost real time ability to plan, assess, and replan.

They are also distinguished by a view of deployment as a single, seamless, origin to destination flow.

*The Critical Seam in Deployment Flow -
The Hand-Off from TRANSCOM to Theater CINC*



In assessing the three major segments of a force deployment, the middle link, from port of embarkation to part of debarkation seems to be in the best shape. USTRANSCOM has both planning responsibility and operational control of that segment.

Movement from CONUS forts and bases to ports of embarkation, though still needing attention to accuracy of unit movement data and training, has improved significantly in recent years and months. However, there is still a significant challenge to managing flow through SPOEs, where up to 50 ships might be access a single port in the first five days.

The weakest segment is in the theater of operations. Specifically, the hand-off of personnel, equipment and materiel from USTRANSCOM to the CINC at the ports of debarkation appears to be the "critical seam" where disruption of the deployment flow is most likely to occur.

Command and control arrangements and responsibilities need to be clear, reasonably standard and well exercised.

The Critical Seam Ports of Debarkation

- At ports of debarkation, the deployment process transitions from strategic lift, a TRANSCOM responsibility, to reception, staging, onward movement and integration (RSOI), a theater CINC responsibility
- Except for well established theaters, e.g., Europe and Korea, assignment of responsibility for the transition is *ad hoc*
- Joint doctrine defining the interface responsibilities are currently in development for the first time
- Planning and execution tools are primitive and deal piecemeal with what should be a seamless process

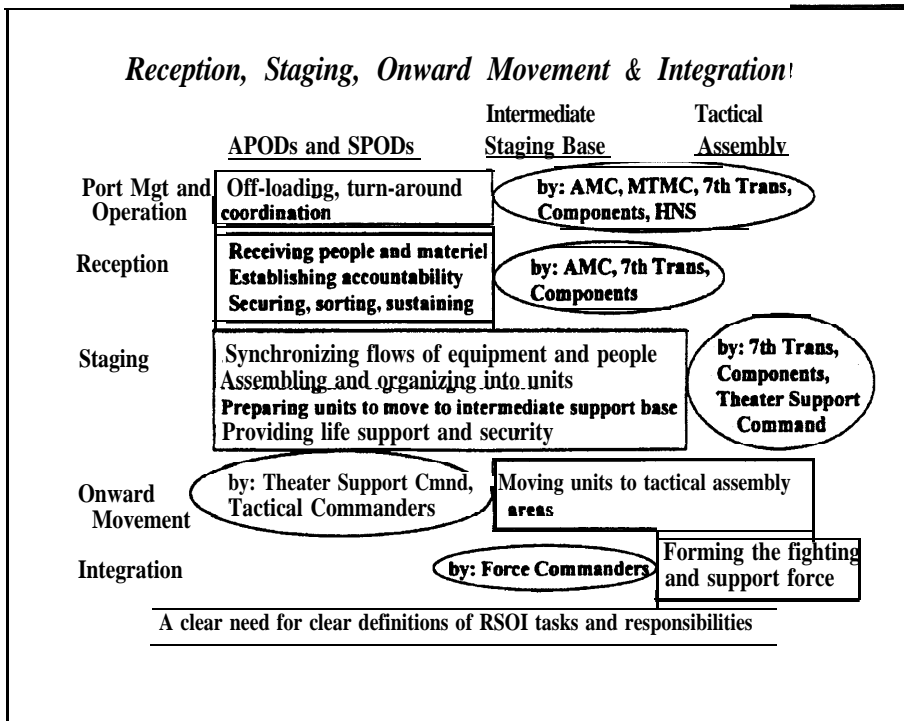
RSOI critical to port throughput (and enhances survivability)

There is shared responsibility at this seam. At common user ports, TRANSCOM is responsible for overall port management exercised through TRANSCOM component commands (often with less than clear definition). The theater CINC is responsible for organizing the forces and for staging and movement to the tactical assembly or logistics support areas.

The Task Force found wide disparity in the readiness of theater CINCs to accomplish the RSOI task. While CINCEUR has focused intensely on this task for a number of years, the demands are significantly different than during the cold war when CINCUER's focus could be primarily on receiving forces from the CONUS.

RSOI in support of the defense of the Republic of Korea has received significant attention over the past two years. Much more work is required to have confidence in a robust capability to meet the MRC goals.

The state of RSOI is less mature for the rest of the possible contingencies.



This chart illustrates the RSOI challenge and roughly illustrates the division of responsibility.

Air Mobility Command manages and operates airlift assets and aerial ports.

Military Sealift Command manages and operates sealift assets to include support in the ports.

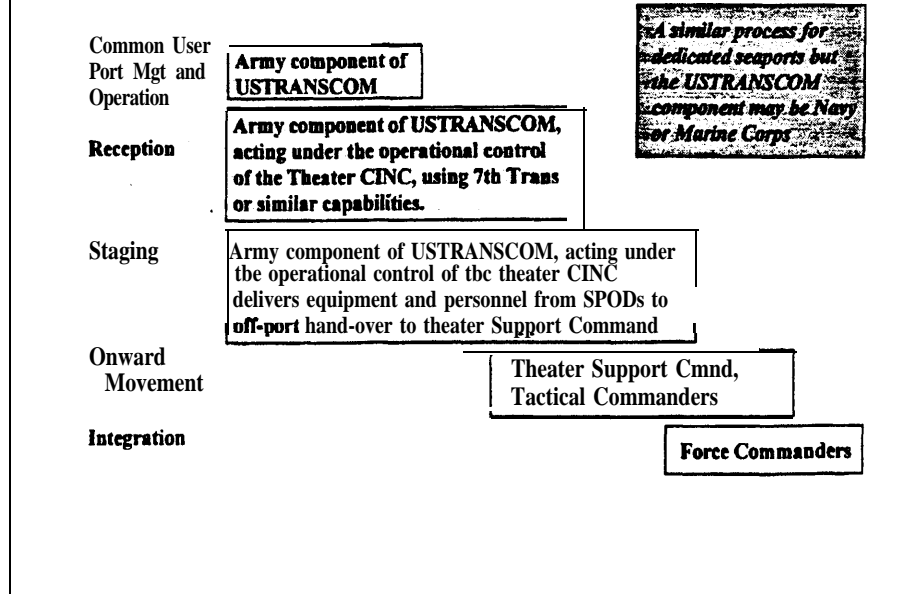
Military Traffic Management Command manages common-user seaports in the CONUS and Europe and at some other locations around the world.

Army, Navy, Marine Corps, or MTMC manage other theater ports under various plans and conditions.

The Army's 7th Transportation Group provides the major tactical capability for material handling and support at SPODs (port operations)

Dedicated ports are generally managed and operated by the involved Service.

***Reception, Staging, Onward Movement & Integration
Proposal to Clarify Responsibilities at Common User Seaports***



The current ad hoc set of arrangements need to be replaced by standard doctrine and well defined command and responsibility arrangements so that the system can train and exercise as it will operate in a contingency.

A continuing complexity is a workable and efficient division of responsibilities between the professional transportation commands and the warfighting CINC. The warfighting CINC must have total operational control over his theater in contingency situations; this does not seem to be in dispute. At the same time, the transportation commands, responding to the operational control of the CINC, should be clearly responsible for delivering people and equipment to an off-port staging location for hand-over to theater organizations. Hand-over is the issue, and it should seldom take place in the seaport. In most cases, seaports are an undesirable place for such a seam.

Further, there should be a single Army component of USTRANSCOM responsible for both managing and operating the port. Currently those two functions are performed by two separate organizations within the Army - 7th Trans reporting to Army Forces Command and Military Traffic Management Command.

For dedicated ports, the Navy component may be the designated port manager and operator.

*Some Positive Trends Requiring Continuing Emphasis
Reception, Staging, Onward Movement & Integration*

- . RSOI process getting much more attention
- . CENTCOM working on RSOI for major regional contingency
- . Services defining theater opening packages and establishing them in unit organization, prepositioned equipment and TPFDDs
- . Services practicing RSOI, including Logistics-Over-the-Shore (LOTS) operations, in deployment exercises
- . USTRANSCOM and Services developing in-transit visibility and total asset visibility capabilities
- . USTRANSCOM working to establish the Army component (MTMC) as the single port manager at common user ports

40

There are some encouraging trends that deserve recognition and reinforcement.

RSOI is now widely recognized as a critical segment of force deployment and is receiving much deserved attention from Service and CINCs' staffs. Plans for Korea are in place. EUCOM and CENTCOM are working on new or revised RSOI plans for major contingencies.

Services have identified the units and equipment needed to open ports and establish lines of communication and have either prepositioned the equipment or planned for its early deployment in TPFDDs. Units are conducting deployment training exercises that encompass the range of deployment activities, including logistics over the shore.

TRANSCOM and the Services are developing the information systems needed to confidently track units and materiel during deployments.

***Areas Needing Significant Further Improvement
Reception, Staging, Onward Movement & Integration***

- Joint and Service doctrine to maximize flow through the ports to tactical assembly areas [CJCS, J-4, Army, USTRANSCOM]
- Assigning responsibility for planning and execution of movement through ports to tactical assembly areas to the appropriate TRANSCOM component [CJCS, J-4, USTRANSCOM]
- Integrating RSOI planning and execution with strategic lift [CJCS, J-4, USTRANSCOM]
- Developing joint theater movements management system [J-4]
- Attention to timely arrival of minimum logistics capability needed to facilitate RSOI [Theater CINCs, J-4, USTRANSCOM]
- Improving rough-sea (sea state 3+) Joint Logistics-Over-the-Shore (JLOTS) capabilities [USD(A&T), CJCS, J-4, USTRANSCOM, Army, Navy]

41

More improvement is needed to ensure that RSOI does not remain a weak link.

Joint doctrine is needed to ensure common understanding across DoD of roles, responsibilities and procedures.

Responsibility should be assigned for planning and executing the final segment of a force deployment from ports of debarkation to tactical assembly areas. Though arrangements have been agreed for Europe and Korea and for at least one other major contingency, arrangements for others remain ad hoc.

As suggested earlier, for common user ports, the responsibilities need to be clearly assigned to a single Army component of USTRANSCOM operating under the operational control of the Theater CINC.

The information systems required for effective RSOI and planing for the critical front end logistics elements need to be high on the priority list.

More emphasis needs to be directed to achieving adequate capability to off-load ships in rough seas when ports are unavailable or inadequate. Many areas of the world where regional contingencies are most likely have poor to barely adequate ports, and even those could be denied during the early days of a US force deployment. Current capabilities for logistics over the shore operations become ineffective in the moderately rough seas that occur over half the time.

*Information Systems Support to
Deployment Planning and Execution*

Information Systems for Deployment Planning and Execution

- **Current systems still primitive by information community (commercial and DoD) standards**
 - JOPES ADP on the Worldwide Military Command and Control System (WWMCCs)
 - Global Transportation Network (GTN) prototype
 - Service-unique transportation management systems
 - Stand-alone mobility models
- **New systems and interim migration systems being fielded**
 - JOPES ADP functionality on Global Command and Control System (GCCS)
 - Global Combat Support System (GCSS)
 - GTN
 - Transportation Coordinators Automated Information for Movements Management System (TCAIMS-II)
- **Demonstrations and research exploring best approach to deployment and other logistics management tasks**
 - Logistics Anchor Desk
 - Joint Total Asset Visibility (JTAV)
 - Battlefield Awareness Data Distribution (BADD)
 - DARPA's Advanced Logistics Program

While there are important initiatives underway to provide a coherent set of information systems for deployment planning and execution, the systems now available do not represent the state of the art.

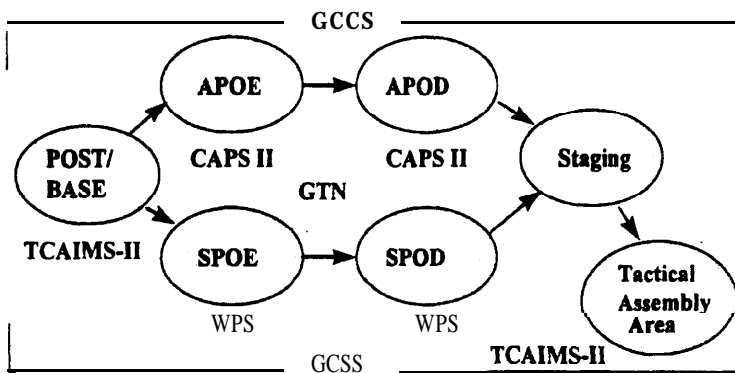
The Global Command and Control System (GCCS) is to replace WWMCCs with an open architecture, adaptable system.

JOPES should be moved from WWMCCs to GCCS by the time this report is published.

The Global Transportation Network is to provide C2 for strategic mobility within the GCCS. It will include in-transit visibility of units, cargo, passengers and patients. It is eventually to be compatible with and tied to the Global Combat Support System.

TCAIMS-II will be the standard (tri-Service) source of information on unit movement characteristics and unit move planning. It too will be tied to GTN and GCCS.

Evolving Deployment Information Architecture



- CAPS II - Consolidated Aerial Port System
- GTN - Global Transportation Network
- TCAIMS II - Transportation Coordinators Automated Information for Movements Management System
- WPS - Worldwide Port System
- GCCS - Global Command and Control System
- GCSS - Global Combat Support System

This chart overlays on the major segments of a deployment, the major information systems that are to be available in the near future for planning and executing major force deployments.

GTN is the command and control system that supports in-transit visibility from posts, camps, and stations to tactical assembly areas.

GCCS and GCSS are to be the common operating environments enabling connectivity among systems.

The chart is not intended to imply a single, integrated system to manage force deployment. That is yet to be designed and created.

Modernizing Information System Concepts

- Current systems do not provide timely or adequate information access to users
- Interim solution reduces numbers of systems from 100+ and uses middleware to lash together legacy systems
 - Mitigates **problems of multi-language, disparate data bases**
 - Often requires ponderous processes to define available data since users have no overarching view of needs
 - Information technology and concepts are available to move to more manageable approaches
 - GCCS Client-Broker-Server approach
 - DARPA Advanced Logistics Program Mediator approach
- Flexible systems that connect users to the information they require, regardless of location, need to be implemented across spectrum of logistics systems

45

Information systems available today to manage force deployment are still primitive by modern information technology standards. While technology is leading to distributed processing capabilities connected by communications networks, most current capabilities are stand alone systems with data in flat files. This data can be accessed from outside the system only with extraordinary efforts to define and build data extraction programs and communications links.

To start the migration toward modern systems, efforts are underway to develop or adapt a set of interim systems that offer some measure of standardization and interoperability.

Solutions are likely to use “middleware.” Interim systems may use a central database serving to collect previously selected data from legacy systems to make it available to a network of user.

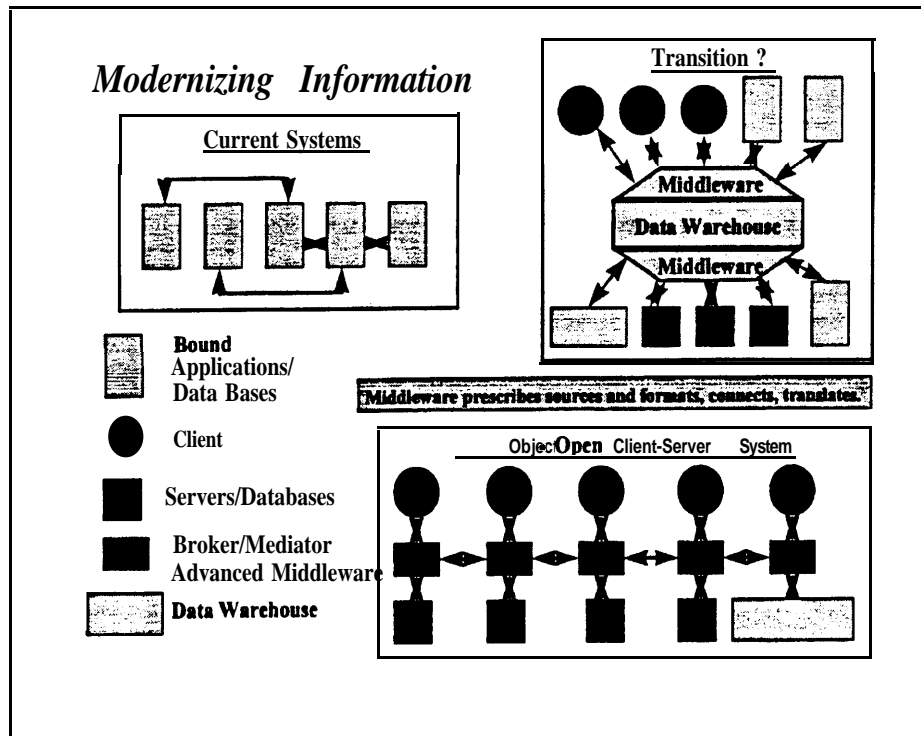
Modernizing Information Systems Concepts (cont'd)

- Push toward interoperability standards must avoid restrictions that constrain the introduction of the best concepts and technology
- Flexible systems that connect users to the information they require, regardless of location, need to be implemented across spectrum of logistics systems
- TRANSCOM approach follows current commercial practices and provides practical solution to migrate from legacy environment to common operating environment

While such interim solutions may be the best approach in the near term, care must be taken to ensure that their standards and capabilities will not be constraints on evolution to the desired system.

TRANSCOM, in designing its GTN, has tapped a commercial off-the-shelf approach that promises to bring significant progress while still facilitating use of future technologies as they mature.

Similar approaches should be featured across the spectrum of logistics systems to provide users access to data they need regardless of location. Extending GTN may be a viable approach to a truly integrated deployment management system.



This chart illustrates the current state of information systems and the transition to more flexible, adaptable systems.

Current legacy systems tend to be bound applications and data bases that can be tied together in various ways, but they are unable to provide the timely information needed to manage a large, dynamic enterprise.

Transition systems in DoD plans and commercial use connect users to needed information by drawing information into and manipulating it within a central data base using various kinds of middleware to reformat, translate, communicate, etc. Once the user needs and data sources are well defined, this approach can provide far faster and wider access to needed information.

Several concepts supported by emerging technologies can help retain the advantages of the data warehouse approach while greatly increasing responsiveness and flexibility. DoD programs should include follow-on plans to evolve further towards this more open, more responsive approach.

Gaps in Emerging Deployment Information

- System still not defined for joint theater movements management
 - Some consider Army's DAMMSR an interim solution - most do not
- JOPES Enhancement needed, planned
 - CCCS will improve connectivity and accessibility to JOPES ADP but JOPES will still have serious user interface problems
- Interface needed between GTN In-transit Visibility and other parts of Defense Total Asset Visibility capability
 - Joint TAV office recently formed
 - Definitions on in-storage, in-process, and in-theater portions of TAV lag GTN
- Interface needed between transportation management system and theater systems for managing personnel and materiel

Several key gaps exist in the emerging set of information systems for force deployment.

There is no system yet defined for the joint theater movement management function. GTN handles the strategic lift segment of the flow; and CAPS II and WPS provide port management information. Still, there is a void for the management of movements from the ports to destinations within the theater. Some consider DAMMS-R an interim solution, but after years of frustration in developing that system, many agree that a fresh start might be a better approach. TC AIMS II is currently envisioned to become the theater movements management system.

JOPES ADP will be part of the new GCCS when it comes on line, and many of the GCCS improvements in user interfaces, accessibility, and hardware will benefit JOPES. However, JOPES functionality will be largely unchanged. A JOPES Enhancement project is planned, though not yet defined. Improvements are needed to provide the theater CINC the capability to plan, in detail, the theater part of the deployment.

GTN will provide the in-transit portion of DoD's Total Asset Visibility capability. The other three parts of that capability - in-process, in-storage, and in-theater - are well behind in development. Nor is it clear how they will tie together.

The interfaces between the transportation management systems being developed by TRANSCOM need to be tied to the personnel management and materiel management systems, especially in theater.

***Some Positive Trends Requiring Continuing Emphasis
Information Systems Support***

- Press on with GTN and TCAIMS-II programs [USTRANSCOM/Army]
 - But establish system development guidelines that ensure evolution to leverage emerging computing and telecommunications technologies

To summarize, there is some good work that needs management support to stay on track. We cite, specifically, GTN and the many transportation systems subsumed under the Transportation CIM program. Still, we are concerned that guidelines for the development of interim solutions afford the ability to evolve to emerging computing and telecommunications technologies.

Areas Needing Significant Further Improvement Information Systems Support

- **JOPEs Enhancement [Joint Staff]**
 - Give priority to developing the dynamic deployment planning and execution tools needed for crisis action planning and execution
 - Exploit DARPA's research on collaborative planning and information dissemination
 - Focus on improving user interfaces
- **Bring together a joint theater movements management information system [USD(A&T), ASD/C3I, J-4, USTRANSCOM]**
- **Create a seamless, fort-to-foxhole simulation of the force deployment process (J-4, USTRANSCOM)**
 - To quickly assess the full feasibility of deployment plans
 - To project the course of ongoing deployment operations
- **Incorporate deployment and RSOI into joint warfighting simulations [J-8, US Atlantic Command]**

50

Earlier, we outlined the characteristics of the dynamic tools needed for crisis planning and execution. These should be the starting point for JOPEs Enhancement, which also should exploit the collaborative planning and information distribution research being done by DARPA.

TRANSCOM working with the Theater CINCs, should add a joint theater movements management system to the suite of transportation management systems it is developing.

TRANSCOM also should develop a comprehensive simulation of transportation flow from origin (forts and bases) to destinations (tactical assembly areas).

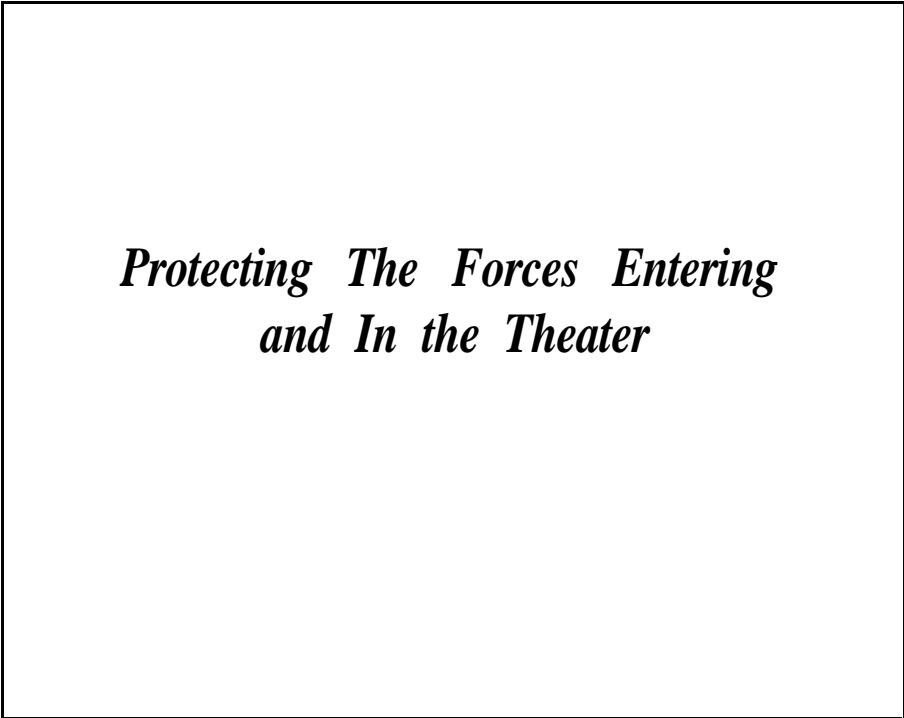
Deployment and RSOI should be incorporated into USACOM's joint warfighting simulation. US forces are most vulnerable during these phases of an operation. Practicing and assessing system effectiveness using simulation could reduce the risks.

***Areas Needing Significant Further Improvement
Information Systems Support (cont'd)***

- Create an over-arching, time-phased plan for evolution of logistics information systems tying together [USD(A&T), ASD(C3I)]:
 - GCCS and GCSS
 - CIM programs
 - Total Asset Visibility efforts
 - ACTDs
 - DARPA Advanced Logistics Research program
 - Developing tactical logistics information systems

51

Finally, USD(A&T) needs to create an over-arching plan for the evolution of logistics information systems. There appear to be many creative efforts underway to exploit information technology to improve logistics management, but each has its own proponents, objectives, funding sources, and schedule. How they tie together in functionality, technology, or time is unclear.



*Protecting The Forces Entering
and In the Theater*

The threats to mobility operations entering the theater include advanced conventional weaponry, nuclear, biological and chemical possibilities, and various types of sea mines.

The Defense Science Board Summer Study of 1995 highlighted this threat. It posited modern adversaries with the motives and means to interrupt the deployment of US and Allied forces.

Force Survivability - Principal Findings

- Training, planning and programming for mobility do not pay enough attention to adversary efforts to deny, delay and disrupt entry into the theater
- Lack of attention to survivability belies the seriousness of the threat
- PODs (sea and air) are particularly attractive targets
- A rigorous systems approach is needed - supported by tools, data, and analysis -- to address the problem as a whole and in its parts

Our principal findings describe continuing lack of attention to survivability, and the attractiveness of the SPODs and APODs as targets. We will elaborate on these in the following charts.

The lack of attention to survivability is not new. Benign circumstances have often been the operative assumption in strategic mobility planning. When problems arise, ad hoc solutions are employed. These ad hoc solutions might be adequate, but they might also be more costly and less effective than simple solutions considered beforehand. Also, it is highly risky to continue to count on ad hoc solutions against increasingly well informed and resourceful adversaries.

There are some important areas where the nation has paid substantial attention to survivability and vulnerability of forces entering a theater. The best examples are Europe and Korea. So expertise and understanding are available for application across the wider spectrum of strategic mobility challenges.

In summary, a comprehensive systems approach is needed, supported by rigorous analysis and tests, and followed by corrective action.

*Lack of Attention to Survivability:
Plausible Threats are Assumed Away*

- There is a pervasive, if implicit, assumption that WMD attacks will be deterred and therefore can be safely ignored
 - This assumption derives too much comfort from Desert Storm outcome - not likely to be the model for future adversary behavior
- The threat from advanced conventional munitions delivered by missiles or aircraft also has not received much attention
 - Versions of munitions that US used with great effect in Gulf War are available for purchase from Former Soviet Union, US allies and other sources
- Inattention to these threats can increase their likelihood
 - Actions to mitigate the effectiveness of these weapons may help discourage use and thus can strengthen deterrent posture

In Desert Storm/Desert Shield, there was no serious threat to the insertion and build-up of forces in the theater (although the Iraqis did fire inaccurate SCUD missiles at ports and airfields, and a few lucky hits could have significantly altered that situation). Future regional adversaries will not likely make it so easy.

The threats to forces entering the theater start fairly far out to sea with mining. These are areas where the Navy is significantly increasing emphasis, recognizing the threat posed by a few even modestly capable submarines and the proliferation of low cost and sophisticated sea mines. Unfortunately, the situation is less well in hand in the joint arena. For example, the strategic mobility JWCA only considers survivability beyond 300 nautical miles from the shore. It ignores any threat to a POD or even the vulnerable phase of movements as forces close through seaward approaches to ports.

The ground maneuver JWCA considers survivability within 300 nautical miles, but has focused on forces after they arrive. Neither TRANSCOM nor the CINCs adequately address survivability and planning in the reception, staging, movement, and force integration (RSOI) activities. Joint efforts dealing with RSOI give scant attention to vulnerability, assuming instead the base case of uninterrupted flow.

To amplify a point made previously, Europe and Korea are theaters where these problems have been identified and addressed. Theater CINCs and their component commanders have devoted substantial attention to these issues, drawing on the experience of the Services and Defense Agencies such as DNA, DARPA, and DISA.

***Lack of Attention to Survivability Belies the
Seriousness of the Threat***

- Future adversaries will have the motives and likely the means to seriously disrupt US strategic deployments
- Some obvious lessons for future adversaries
 - If the US military arrives on time, in force (intact), the adversary loses
 - If the adversary can raise the price high enough, maybe the US won't want to come or host nations won't let them
 - If the US military can be delayed substantially, maybe the adversary won't lose - militarily or politically
- Threats to US mobility can be:
 - Coercive, e.g., persuading others not to cooperate
 - Direct threats, e.g., attacks on PODs, logistics nodes, ships/planes, C4 systems
- Direct Threats include:
 - Missiles, mines, SOF, aircraft, submarines, etc.
 - Advanced conventional, chemical, biological, nuclear
 - Offensive information warfare

A major lesson that future adversaries are likely to have well in hand comes from the Gulf War: *if the US arrives in force, it wins*. That realization will provide the motive to build capabilities with which to disrupt and delay US deployment activities.

Adversaries can take either or both of two approaches: they can be coercive, persuading others not to cooperate, or they can engage in direct attack. Included in the attack options are attacks on our command and control systems and the use of information warfare. While the Task Force focused on the attack threat, the coercive threat also deserves attention.

*PODs (Sea and Air)
Particularly Attractive Targets*

- PODs become the bottleneck: massive amounts of US personnel, materiel and POL pass through and may pile up at relatively few sites
 - Gulf War experience: 96% of sea cargo through two SPODs, 78% of air cargo through five APODs
- PODs lie on a seam between the force provider and the warfighter - needs attention to unity of command
- PODs are functionally relatively soft targets - more so if dependent on contracted host nation support
- PODs are within reach of missiles, UAVs, aircraft, and SOF. Locations are known or can be established with modest Humint (non technical) efforts

Sea and air PODs are particularly attractive targets since they are likely to be bottlenecks where people and material pile up. In the Gulf War, almost all the sealift cargo (96 percent) came through two SPODs. For air cargo, 78 percent came through five APODs. Furthermore, the PODs are the seam between the professional transporter - TRANSCOM - and the warfighter. Operations at the PODs involve relatively soft and critical targets, in addition to people and materiel. Host nation support personnel are involved, many being civilians (possibly untrained and inexperienced) under contract. Facilities and functions can be severely degraded, with long recovery times.

Many of these lucrative targets will be within range of adversary forces. Information about our actions at the PODs is easily acquired through human sources available to almost any regional adversary.

***Systems Approach Needed
Supported by Tools, Data, and Analysis***

- Extensive modeling of flow to potential MRCs - changes of several percent can be significant
 - But, flow models must consider threats -whose effects can be much more than several percent
- Our understanding of the disruptive potential of attacks is vague and qualitative at best
 - "CW attacks will slow things"
 - Little quantitative analysis illuminating specific degrees of disruption and what can be done about it
- Current mobility and C2 tools/software need modification to accommodate survivability inputs
- Need to focus attention on affordable actions that can reduce vulnerabilities and contribute to deterring threats
- Requires a systems approach involving warfighters, active and passive defenders, C4 community, logisticians, transporters

There is no silver bullet solution to the vulnerability challenge. A tough, grinding, continuous systems approach is required to understand and minimize the disruptive potential attacks against vulnerabilities. While analysis tools can examine the flow of people and materiel into a theater, most do not consider the impact of disruption, so the potential impact is not well quantified. Without quantification, it is difficult to focus on ways to deal with the potential impact.

The Task Force was unable to find any comprehensive, end-to-end analysis of strategic mobility vulnerabilities.

***Some ACTD Activity Directed at the Deployment
Survivability Problem - More Needed***

Relevance	Threat	
	WMDs	Conventional Weapons
Directly Addresses Problem	Air Base/Port Biological Detection	
Relevant to the Problem	Cruise Missile Defense II Counter Proliferation Wide Area Tracking	Cruise Missile Defense II Joint Countermine

58

Several advanced concepts and technology demonstrations have been planned that are applicable to some of these vulnerability challenges. More work is needed.

This chart shows some ACTDs that deal with weapons of mass destruction and advanced conventional weapons by either addressing the problem directly or undertaking activities related to the problem.

The biological detection ACTD is intended to provide systems for timely warning of chemical agent attack. Clearly, this is an essential prerequisite for both biological and chemical defense. We understand there are plans to expand the scope of this ACTD to include individual and collective protection measures. Both early warning and response to warning are vital matters that deserve strong support.

The benefits of the ACTD approach are well understood. These experiments involve the developer and warfighter in a particularly important partnership to address key problems and to leave capability for subsequent warfighter support.

Systems Approach to Protecting the Forces
Three Types of Reinforcing Concepts

- 1. **Defending logistic nodes and assets**
 - CBW defense
 - Countermine
 - ASW
 - Air and missile defense
 - Base and port security
 - Host nation support measures (e.g., damage control planning & training, inexpensive masks and protection)
- **Leveraging Deployment Concepts**
 - Just-in-time delivery
 - Over the shore delivery
 - More rapid RSOI
- **Expanding Warfighting Concepts**
 - More remote shooters and sensors
 - Lighter, more mobile and agile forces with heavy force firepower

We recommend a reinforcing systems approach since a number of means and measures can often achieve the needed result. The objective is to fully understand the nature of the vulnerabilities and to seek robust solutions for the least effort in cost and time.

In many cases, the solutions may not require acquisition. Doctrine, planing, training, passive measures, command & control, etc., can all make a contribution once the vulnerabilities are examined and acknowledged.

It is not expected that solutions will occur without acquisition, but in the long run, solutions will require new warfighting concepts that recognize the need to reduce the vulnerabilities of logistics nodes and functions. Such concepts will reduce the attractiveness of targets through new force and deployment concepts, as well as with robust defenses of the few unavoidable areas of concentrated build-up of people and materiel.

Some General Recommendations

- **More:**
 - High level attention
 - Analysis to quantify vulnerabilities
 - Exercises and tests to get data
 - Demonstrations to evaluate options
- **All incorporated into a comprehensive systems approach**

Extract benefits from improved concepts, organization, planning and training before considering more expensive solutions

Here is a series of general recommendations, with increased high level attention being the key to the rest. The following charts will address these recommendations in more detail.

***Areas Needing Significant Further Improvement
Protecting the Forces***

- Expand the JWCA to include a realistic and comprehensive analysis of ways to reduce deployment vulnerabilities, focusing on PODs and RSOI functions in future MRCs [USD(A&T) & VCJCS]
 - Take a comprehensive systems approach
 - Use “red teams” to identify vulnerabilities
 - Supported by USTRANSCOM, BMDO, ATSD(NCB), others
- Clearly assign responsibility for protection in the theater to the theater CINC. Assign USTRANSCOM lead responsibility to incorporate deployment protection and survivability impacts into deployment planning and modeling. [CJCS]
- Task DIA for assessments of near and long term threats to US strategic deployments to regional contingencies [DepSecDef and CJCS]

The recommendations above fall into two categories for action – those by the Under Secretary for Acquisition and Technology and those by the Chairman, Joint Chiefs of Staff.

There is a need to expand the JWCA to include a comprehensive analysis of the vulnerabilities and ways to reduce them, focusing on the PODs and the RSOI functions.

The JCS should task TRANSCOM to incorporate survivability and its impacts into formal planning and modeling now under development.

The CJCS should task the CINCs to place increased emphasis on deployment survivability, and task the Defense Intelligence Agency to assess both near and long term threats to strategic deployment for regional contingencies. The assessments should include operational and tactical movement through ports and tactical assembly areas.

***Areas Needing Significant Further Improvement -
Protecting the Forces (cont'd)***

- Incorporate more frequent and detailed threats to deployment in high level war games and exercises [DepSecDef and CJCS]
- Support and expand the Air base/Port biological detection ACTD: include protection, decontamination, other measures [USD(A&T), DARPA]
- Conduct tests, exercises, and simulations to get data on operations at PODs [USD(A&T) & CJCS]
 - Embarkation and Debarcation exercises
 - In CBW defensive postures, e.g., do Salty Demo type exercises for APODs/SPODs (Salty Demo I in the mid 1980s examined fighter operations)
- Identify ways to protect host nation support in the face of CBW threats, including US assistance on active and passive defenses [USD(P)]
- Increase the focus on reducing deployment footprint and other logistics burdens as a factor when making resource allocations and investment decisions [USD(A&T) & CJCS]

62

An additional set of actions requires attention in high level wargames and exercises to emphasize developments such as those envisioned in the ACTDs discussed earlier.

Tests and exercises are needed to work through the challenges and solutions at the PODs and the heavy use period at the SPOEs.

In the past, extensive experiments have helped define the nature of and solutions to such challenges. For example, "SALTY DEMO" successfully focused attention on vulnerability and needed survivability measures at tactical fighter bases. Those same methodologies and techniques are appropriate for key mobility nodes.

While much of host nation support might seem inherently fragile, it can still be made more robust than is currently the case.

Finally, the reduction of materiel movement requirements made possible through use of "smart weapons" and other technologies can multiply the payoffs - smaller packages, less transportation, smaller and less vulnerable footprint, etc. The acquisition process should recognize and reward attention to these benefits.

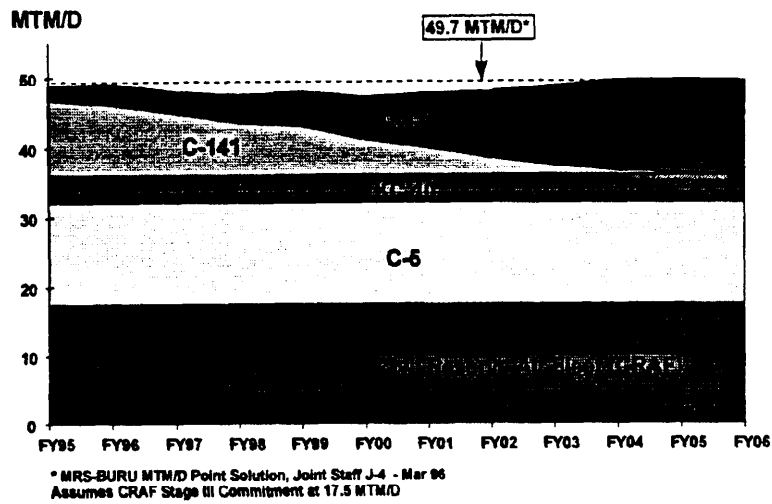
Lift and Prepositioning Capabilities

Movement Enablers - Fort to Port

- . **CONUS Infrastructure - 25 Sites**
- . **Railcars**
 - 514 bought in FY 93-95 - 543 more planned through FY00
- . **Containers + MHE/CHE**
 - 4,539 bought FY 93-95
- . **Watercraft**
 - Army POM supports 63 pieces for 1st MRC
- . **C2 Systems**
- . **Training**
 - Sea Emergency Deployment Readiness Exercises (SEDRE) - 6/year 94, 95, 96 - Army planning to reduce to 2/year after FY96
 - Joint Strategic Deployment Training Center
 - Warfighter Deployment Program
 - Port Opening Tiger Teams

Using lessons learned from Desert Storm, Somalia, and the MRS BURU, considerable effort and funds have been focused on and are enhancing fort-to-port movement and rapid onloading of vessels

**Strategic Airlift Capability Vs. Requirement
Millions of Ton Miles/Day**



This chart depicts the planned strategic airlift capability vs. the stated requirement. If the program continues to unfold as currently planned and funded, force capability will be close to the requirement for intertheater airlift.

Civil Reserve Air Fleet (CRAF)

- **Established by 1951 Executive Order, Confirmed by 1987 National Airlift Policy**
- **CRAF provides approximately 19.5 MTM/D of total cargo capability of 49.7 MTM/D MRS BUBU requirement**
- **Activated only for 1990 Persian Gulf Crisis**
 - **20% of Missions**
 - **Deployment - 62% of Pax, 27% of Cargo**
 - **Redeployment - 84% of Pax, 40% of Cargo**
 - **Total Cost - \$1.35B**
- **CRAF carriers used routinely for peacetime operations and in contingencies without activation - Haiti, Bosnia "Provide Promise," Turkey "Provide Comfort," Ocean Venture, Persian Gulf "Desert Sortie," CIS "Provide Hope," Arabian Peninsula, Egypt "Bright Star," Thailand "Cobra Gold," Iraq "Southern Watch," Korea "Team Spirit"**

The CRAF program used to augment organic airlift continues to improve intermodal transport of troops and critical equipment in response to peacetime and conflict demands. The regular exercise of CRAF has proven the concept and facilitated continuing improvements.

CRAF - A Model for Commercial Participation

- Pre-negotiated rates
- Bilateral contracts
- Continuous DoD/DoT/Industry partnership
 - Peacetime AMC Contracts proportional to CRAF commitment -
Based on Mobilization Value (MV)
 - Stage I - Minor Regional Crises - 24 hour notice
 - 90 Long-Range International aircraft
 - Stage II - Major Regional Conflict - 24 hour notice
 - 286 International, Aeromedical, & National aircraft
 - Stage III - National Mobilization - 48 hour notice
 - 592 International, Aeromedical, & National aircraft
- Major shortfall-Aeromedical
 - Stage II - 19 vs 25 requirement, Stage III - 19 vs 44 requirement
 - Mismatch between modules designed for 767 and availability of 767

CRAF is a model for DOD/DOT partnership in addressing strategic lift needs. It reflects the flexibility required to respond to a wide range of contingencies and peacetime needs.

Sealift Capability vs Requirement

- . Requirement: 5-1/3 Army Divisions, 9,000 miles in 75 days plus Marine Expeditionary Forces
- . The Plan:
 - Prepositioning - 34 ships
 - . Land: 6 Army brigade sets, 1 Marine Expeditionary Brigade
 - . Afloat: 1 Army brigade set, 3 Marine Expeditionary Brigades, Air Force ammo, DLA fuel
 - DoD Organic Requirement for Surge - 10 million sq. ft. by 2001
 - . 11 LMSRs (3.0 million sq. ft.)
 - . 8 FSS - 33 knot ships in high state of readiness
 - . 65 RRF (includes 36 RO/RO) - 4,5,10 and 20 day responses
 - MSC controlled commercial fleet (contract)
 - Commercial charter market-bilateral agreements
 - Commercial for Sustainment
 - . 7,000 TEU/week
 - . 22,000 TEU ammo
 - . 76,000 STONs breakbulk ammo

Assuming fleet repair and maintenance funds and National Sea Lift funds remain intact, current plans produce adequate sealift through 2005.

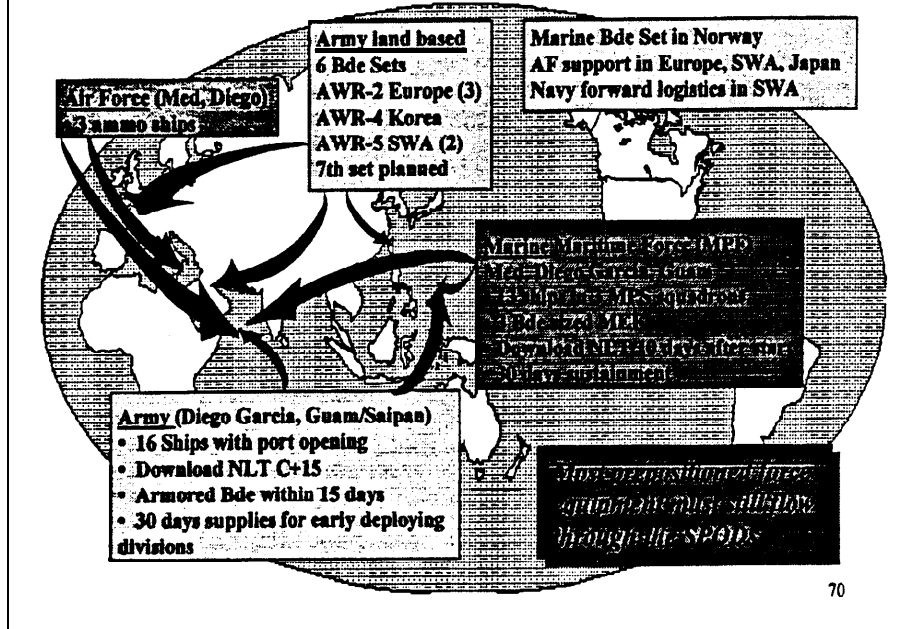
Commercial participation (US Flag) is key to the sustainment phase of force support.

Voluntary Intermodal Sealift Agreement (VISA)

- . Modeled after CRAF
 - Stage I - Minor Regional Conflict - 24 hour notice
 - . 4,500 TEU/wk general cargo, plus ammunition
 - Stage II - Major Regional Conflict - 24 hour notice
 - . 7,000 TEU/Wk general cargo, plus ammunition
 - Stage III -National Mobilization - 48 hour notice
- . Provides assured access in wartime
- . Pre-established rate methodology
- . Focus on capacity vs. vessels
- . SecDef approved Stage III on 30 Oct 1995
- . Working to formalize remaining implementation
- . USCINTRANS, on SecDef approval, has activation authority for stages and II
- . DoD, DoT, and industry partnership

VISA has been devised to help ensure access to sufficient lift capability for the sustainment phase of contingency operations.

Worldwide Prepositioning - FY01



Worldwide pre-positioning is essential to early response in MRC-East or West.

The Army Global Pre-Positioning Strategy programs seven brigade unit equipment sets, a division support base unit equipment set, and a corps/theater opening support unit equipment set. An eighth brigade unit equipment set is being planned. Six of these sets are land based.

The Army Pre-positioned Afloat (APA) consists of 14 ships with an armored brigade, CS/CSS unit support and 15 days sustainment (7 ships), a port opening capability (2 ships) and 30 days of essential sustainment stocks for the early deploying divisions (5 ships). The brigade is combat ready NLT 7 days from initiation of offload.

The Marine Corps Maritime Prepositioning Force consists of 13 ships in 3 MPS squadrons. Each squadron provides a brigade sized air/ground force to complete off-loading within 10 day. Each brigade consists of:

- 17,300 personnel
- 164 armored vehicles (30 tanks)
- 30 days sustainment
- 50 tactical Air and 63 rotary-wing aircraft.

Sealift Improvements Since Operation Desert Storm

- **Today:**
 - Active Afloat Prepositioning increased by 64%
 - Partially Crewed Ready Surge (ROS 4/5) program implemented
 - 35% of surge fleet partially crewed
- **Planned by 2001:**
 - Active Afloat Prepositioning increased by 155%
 - 60% of surge fleet partially crewed
 - Total Sealift Capacity almost doubles

National sealift plans will produce adequate sealift to support the two MRC assumptions if the acquisition plan can be supported through the multiple budget cycles required.

MPF Enhancement - MPF(E)

- **Requirement:**
 - Stated in USMC Mission Area Analysis
 - Lessons learned from Desert Storm
 - Equipment needs exceed current MPF space availability
- **Chairman's Program Assessment:**
 - Support requirement for MPF(E), procure first MPF(E) ship
 - Delay purchase/conversion of 2nd and 3rd MPF(E) until funds for CONUS surge LMSRs and RRF fully obligated.

The MPS enhancement requirement is driven by new needs identified from Desert Storm lessons learned. The limitation is space on existing ships.

The CJCS, in the FY97 to 2001 Chairman's Program Assessment, states the priority of MPF(E) ships is next in priority to the LMSR and RRF RO/RO acquisition programs.

MPF Enhancement (cont'd)

- **Additional capability to be added to each squadron:**
 - Expeditionary airfield
 - Naval Mobile Construction Battalion equipment
 - Fleet Hospital set
 - TE restoration
 - Sustainment
- **Congress appropriated \$110M in FY95 for 1 MFP(E) ship**
- **2nd ship re-authorized in FY96 with no additional funding**

The additional capabilities to be added to each squadron are as shown

Congress has approved the acquisition of two MPF(E) ships but funded only one.

Under the streamlined acquisition approach, the design and conversion contract has been combined in an operating contract. An operating company, shipyard and ship owner team will design, convert, and ultimately operate the government owned MPF(E) ship.

LOTS Roll On/Roll Off Discharge Facilities

" . . . port denial is one of the most likely early scenarios. "
- Mobility Requirements Study

.Adequate Roll On/Roll Off discharge facilities critical to support 2 MRC strategy

Roll On/Roll Off Discharge Facility Contribution (1 MRC)*	
Condition	Turnaround(days)
Pierside	4
2 RRDFs	8
1 RRDF	12
0 RRDF	45**

*Sea state 2
**Must use Lift-Off vs. Roll-Off

.Need to accelerate Sea State 3 JLOTs capability

74

The Army has unfunded requirements to complete Sea State 2 lighterage. Each RRDF cost is \$5M. Total cost is \$93.7M.

The table demonstrates the contribution of the RRDF to offload capability.

Sea State three lighterage (a more realistic requirement) needs approximately \$300M and is currently unfunded.

JLOTS Sea State 3(SS3) Capability R&D Efforts

- Amphibious Cargo Beaching Lighterage (ACBL)
 - Replace existing Navy Lighterage
 - Possible Joint procurement with the Army
 - Still in early stages of R&D
 - Attempting to accelerate IOC (currently FY 02-04)
- Related SS3 Capability initiatives
 - Robust mooring and fendering system
 - Advanced shipboard crane technology
 - Rapidly installed breakwater system (RIBS) -- Army R&D

Both the Navy and Army are working to provide more robust capability to move through minor, possibly austere ports.

The Navy is developing Sea State 3 capable amphibious cargo beaching lighterage to replace the current inventory. Although the program is still in early development, the Joint Staff has asked the Navy to accelerate IOC to allow Joint Army/Navy procurement in FY98. Joint procurement promises economies of scale and interoperability. Increased capability has important throughput and survivability implications.

Related systems must also be upgraded for the SS3 environment. Research and development for these related systems is underway.

Additional Sea Lift Challenges

- Ammunition transportation
 - Aging ships
 - Handling containers in the theater
 - Port limitations -- quantity-distance
 - West Coast ports
- Ready Reserve Force (RRF) program
 - 31 purchased
 - Purchase of remaining 5 delayed by congressionally mandated use of \$50 million of National Defense Features for US flag commercial ships
 - No US flag RO/RO's meet specifications
 - Specific NDF not identified
 - Questions about availability of ships in crisis
 - "Buy America" motive may be counterproductive to US shipping industry in this case
- Need to replace Fast Sealift Ships (FSS) starting around 2010
- Foreign flag agreements - KFS, NATO (Saudi Arabia in progress)
- Continuing congressional support for lift programs

Seaborne ammunition transport and handling and port ammunition handling capabilities are deteriorating due to age and capacity demands. There is no high capacity West Coast ammunition handling port.

Ammunition Transportation Challenges

- Palletized ammo loading/discharge using conventional breakbulk ships is time consuming and ties up the ports
- Containerized ammo in commercial liner service has not been demonstrated
 - Transshipment in foreign ports
 - . Net explosive weight limitations
 - . Require dedicated, approved slips
 - No random access to specific munitions
 - Insufficient theater seaport/inland infrastructure

Ammunition handling and efficient throughput continue to be significant challenges in the strategic mobility equation.

Current breakbulk ships are not optimized for quick efficient ammunition offload/onload (less than 50 tons per hour per crane).

Container vessels have not proven effective as a commercial (lease) substitute. The cost and schedule demands conflict with commercial multi-ship, multi-port operations.

Further, there is no West Coast port capable of large high speed ammunition transfer. There are some significant funded improvements:

- Upgrading West Coast outload capability .
 - Concord (FY97/98) - pier renovation/container cranes/staging area
 - Port Hadlock (FY95) - staging area
- Turbo Cads -- highlighted problems with containerization

The State of Some Lift Programs

- . C-17
 - FOC with 120 aircraft FY05/01 - multi-year buy of remaining 80 aircraft finalized
- . LMSR
 - FOC with 19 ships FY99/01 -funding through FY99-\$6B
 - First conversion delivered in May 96
- . RRF RO/RO acquisition -- 31 of 36 procured
- . MPF-Enhanced [MPF(E)]
 - Three ships required
 - One funded in FY95, a second authorized but not funded
 - CJCS priority is surge sealift first, MPF(E) second
- . 8th Army Brigade set location to be determined and funded

Sealift funding and support seems to be reasonably on track, but the program is matched to requirements with no margin and no allowance for less than optimum flow.

Reserve Accessibility to Support Strategic Mobility

- **Presidential Selected Reserve Call-Up (PSRC)**
 - Process undergoing refinement by Joint Staff (JCSMD) to improve accessibility
 - Up to 200K for not more than 270 days
 - Presidential approval required
- **Prime the transportation pipeline**
 - Approximately 10,500 reserve component members
 - Opens ports and starts flow moving
 - Not a substitute for PSRC request procedures

Procedures are in place for rapid response of reserve forces in support of strategic mobility. Still, careful attention is required to ensure that the capabilities to prime the transportation pipeline early in a contingency are robust and highly responsive. Reserve forces are particularly critical to theater RSOI effectiveness.

***Some Positive Trends Requiring Continuing Emphasis
Lift and Prepositioning Capabilities***

- The full C-17 strategic airlift program
- The LMSR, RRF organic sealift, and MPF(E) programs
- The Sealift Readiness Program reoriented to the carriers' system capacity and associated management programs vice just ships and containers (TRANSCOM lead)
- MARAD and TRANSCOM industry/government Joint Planning and Analysis and War Games
- Expanded Navy/USMC prepositioning afloat participation in RSOI capabilities

These programs have been validated and are well supported by the CINCs and other DoD leadership.

While funding is identified and supported, that support must continue to satisfy the MRS/BURU requirements.

The Sealift readiness program needs to be expanded to include the end-to-end intermodal system. The process then needs to be exercised by DoD, MARAD and private sector players.

Further, to enhance joint capabilities, the Navy/USMC should be more fully engaged in contributing their RSOI knowledge and experience to Joint Operations.

***Areas Needing Significant Further Improvement
Lift and Prepositioning Capabilities***

- Accelerate Sea State 3 Logistics Over the Shore/Joint Logistics Over the Shore capabilities. [USD(A&T), CJCS, J-4, Army, Navy]
- Improve containerized shipping and handling capabilities to support ammunition movement from the fort to the foxhole. [J-4, Army]
- Focus on Army and USMC assets to support intratheater movement. (Develop models to simulate, in detail, C2, information systems, port capacity, host nation support requirements, main supply routes, cargo handling equipment, trucks, etc.) [CJCS, J-4, Army]
- Address intratheater outsize airlift objectives in the April 1996 Joint Staff Intratheater Airlift Analysis Study. [CJCS, USTRANSCOM]

81

Sea State 3 handling capability for LOTS is essential for any significant improvement in movement of forces and sustainment ashore. The significant is multiplied if the adversary takes action against established ports.

There is a demonstrated need for smaller ships to move ammunition and subsequent shore handling of 20' TEUs.

Models and simulations are essential to plan and rehearse the intermodal system to include RSOI, C2 and port operation.

The JCS stated requirement for additional intratheater outsize cargo airlift capability still needs to be addressed.

***Areas Worthy of Continued
Investigation/Development
Lift and Prepositioning Capabilities***

- **Fast sealift** - a worthy goal is to replace the FSS as it ages out with capability to close forces in 1/2 the currently planned time - stay abreast of commercial initiatives for ships with 50+ knot performance
- **Very large lighter than air craft** - 500 tons - track commercial development
- **Mobile Offshore Base** - has become a serious USMC concept. Support the virtual prototype program to:
 - Investigate engineering feasibility
 - Continue to develop concepts
 - Evaluate utility

82

Future R&D projects and ACTDs should include examination of faster sealift vessels with the potential to drastically reduce transit times. Commercial projects are underway and should be closely monitored by DoD.

DoD should also assess, and support as appropriate, commercial - development of large capacity lighter-than-air programs.

The Marine Corps is currently showing interest in the mobile off-shore base concept. It is indeed an exciting idea. However, there needs to be a comprehensive analysis of the operational concept, survivability, degradation due to attack, etc. This should be accomplished before a large commitment.

The Top Five [USD(A&T), CJCS]

- **Make deployability and supportability when deployed first among equals in the criteria for evaluating new doctrines, concepts and systems**
- **Create a seamless fort-to-foxhole architecture for deployment with clearly assigned responsibilities for joint doctrine, processes and C4 of the deployment flow**
- **Create a coherent management structure and an overarching architecture for the myriad of information system modernization programs for strategic mobility from fort to foxhole**
- **Rationalize the just-in-case approach to planning for combat and support forces for contingency operations and the best-case approach to planning to deploy those forces. Insist that realistic what-ifs regarding vulnerabilities of forces entering the theater be considered in deployment planning.**
- **Maintain strong support for the airlift and sealift programs**

83

Finally, this top five list encompasses the most critical set of areas demanding the attention of senior DoD leaders.

Acronyms

ACBL	Amphibious Cargo Beaching Lighterage
ACTD	Advanced Concept Technology Demonstration
ADP	Automatic Data Processing
AMC	Air Mobility Command
AMP	Analysis of Mobility Platform
APOD	Aerial Port of Debarkation
APOE	Aerial Port of Emarkation
ASW	Anti-Submarine Warfare
ASTD(NCB)	Assistant to the Secretary of Defense (Nuclear, Chemical, Biological)
AWR	Army War Reserve
BADD	Battlefield Awareness Data Distribution
BDE	Brigade
BMDO	Ballistic Missile Defense Office
C2	Command and Control
C4I	Command, Control, Communications, and Computer Systems
CAPS	Consolidated Aerial Port System
CBW	Chemical and Biological Warfare
CHE	Cargo Handling Equipment
CIM	Corporate Information Management
CONPLAN	Concept Plan
CRAF	Civil Reserve Air Fleet
CS	Combat Support
CSS	Combat Service support
DAB	Defense Aquisition Board

Acronyms (cont'd)

DAMMS-R	Department of the Army Movement Management System-Redesign
DARPA	Defense Advanced Research Projects Agency
DISA	Defense Information Systems Agency
DLA	Defense Logistics Agency
DNA	Defense Nuclear Agency
DOT	Department of Transportation
DTS	Defense Transportation System
ELIST	Enhanced Logistics Intratheater Support Tool
FM	Field Manual
FOC	Full Operational Capability
FSS	Fast Sealift Ship
GCCS	Global Command and Control System
GCSS	Global Combat Support System
GTN	Global Transportation Network
IOC	Initial Operating Capability
ISB	Intermediate Support Base
ITV	Intransit Visibility
JFAST	Joint Flow and Analysis System for Transportation
JLOTS	Joint Logistics Over the Shore
JMCC	Joint Mobility Control Group
JOPEB	Joint Operation Planning and Execution System
JTAV	Joint Total Asset Visibility
JTCC	Joint Transportation Corporate Information Management Center
JWCA	Joint Warfighting Capability Assessment
LMSR	Large Medium Speed Roll-On/Roll-Off ship
LOTS	Logistics-Over-the-Shore

Acronyms (cont'd)

MAGTF	Marine Air Ground Task Force
MARAD	Maritime Administration
MEF	Marine Expeditionary Force
MHE	Material Handling Equipment
MPS	Maritime Pre-Positioning Ship
MPF-(E)	Maritime Pre-Positioned Force (Enhanced)
MRC	Major Regional Contingency
MRS BURU	Mobility Requirements Study Bottom Up Review Update
MSC	Military Sealift Command
MTMC	Military Traffic Management Command
MTM/D	Millions of Ton Miles/Day
Mv	Mobilization Value
OMFTS	Operational Maneuver from the Sea
OPLAN	Operations Plan
PAX	Passengers
PC	Personal Computer
POD	Port of Debarkation
POE	Port of Embarkation
POL	Petroleum, Oil, Lubricants
RO/RO	Roll-On/Roll-Off
ROS n/n	Ready for Operational Service days/days
RRF	Ready Reserve Fleet
RSOI	Reception, Staging, Onward Movement and Integration
SEDRE	Sea Emergency Deployment Readiness Exercise

Acronyms (cont'd)

SPOD	Seaport of Debarkation
SPOE	SeaPort of Embarkation
SS3	Sea State 3
SWA	Southwest Asia
TAA	Total Army Analysis
TALCE	Theater Airlift Control Element
TAV	Total Asset Visibility
TPFDD	Time Phased Force Deployment Data
TCAIMS	Transportation Coordinators Automated Information Management System
TOE	Table of Organization and Equipment
TRANSCOM	US Transportation Command
UAV	Unmanned Aerial Vehicle
USACOM	US Atlantic Command
USCENTCOM	US Central Command
USFK	US Forces Korea
USPACOM	US Pacific Command
USTRANSCOM	US Transportation Command
VISA	Voluntary Intermodal Sealift Agreement
WMD	Weapons of mass Destruction
WPS	Worldwide Port System
WWMCCS	Worldwide Military Command and Control System

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