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ARMY SYSTEM FOR MOBILIZATION REQUIREMENTS PLANNING: SUPPLY CLASSES V AND VII (AMMUNITION AND EQUIPMENT)

ENGINEER STUDIES CENTER

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ARMY SYSTEM FOR MOBILIZATION REQUIREMENTS PLANNING: SUPPLY CLASSES V AND VII (AMMUNITION AND EQUIPMENT)

Engineer Studies Center
U.S. Army Corps of Engineers

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This report details the framework for a process which measures the munitions and equipment requirements to support a mobilization of the United States. The process examines only Army-managed items of supply--certain equipment and ammunition. It is a management tool for implementing and maintaining a mobilization planning system throughout the Army. The report is one of five produced by the Engineer Studies Center for the Deputy Chief of Staff for Operations and Plans as part of its study: mobilization requirements for industrial preparedness planning. The four other reports, all published in 1989, are: Assessment of the Methodologies For Determining Materiel Requirements For the Current Force, Determining Materiel Requirements For Force Expansion, Army Mobilization Materiel Requirements To Support the Contintental United States Military Base Structure, and Wartime Support of US Friends and Allies: An Assessment of the Planning Environment.

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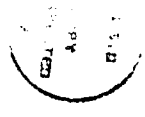

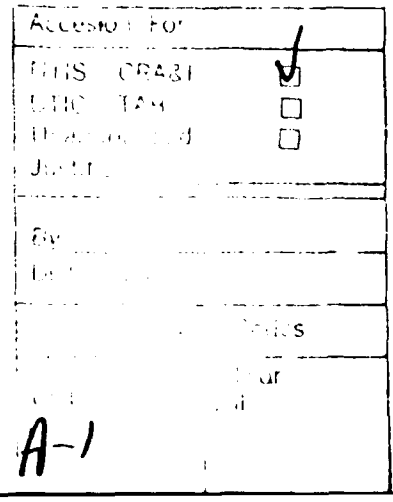

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EXECUTIVE SUMMARY

This report outlines a planning system, called MOBNET, for estimating the materiel requirements to support a mobilization of the United States Army. MOBNET estimates the mobilization needs for ammunition (Class V) and equipment (Class VII) procured through the staff of the Army Materiel Command. It examines the full spectrum of potential claimants, to include current, expanded, and non-U.S. forces, and forces assigned to activities within the continental United States and to other military services.

The framework for the entire system is displayed in 13 charts which make up Annex A of this report. Although the system is *complex*, it is not *complicated*. The charts provide a management tool for implementing MOBNET. They show the relationships between various decision support systems and data bases identified as MOBNET components. This information will help coordinate the development of the components.

MOBNET will require several years to develop and represents a considerable investment of resources. The result will be a methodology for estimating defendable requirements to sustain a conventional war.

The Engineer Studies Center made three recommendations based on its 2-year analysis of the mobilization issues. The Army should:

• **Get serious about planning for total mobilization.** Directives and guidance from the Departments of Defense and Army call for force expansion planning. Force structure compromises over the years have resulted in a plan to field a force [the JCS Planning Force] which is, by its own definition, ***barely acceptable.*** Furthermore, many doubt that the industrial base can provide products in the quantities necessary to sustain a significant force in extended conventional combat. Extensive planning is needed to bring industrial capability, force capability, and operational planning into symmetry.

• **Adopt MOBNET as its method of determining materiel requirements for mobilization.** The system will capture all requirements to support mobilization. The system development and maintenance costs can be shared among a number of commands and staffs, each of which will benefit from an institutionalized MOBNET. The participating commands will find use for not only the mobilization data generated by MOBNET, but also the data generated by the component systems supporting MOBNET. Many of these component systems and their data bases are being funded and developed now. The system architects, in these cases, need to ensure that their systems produce reports which conform to the MOBNET data protocols. In other cases, productivity *cannot* improve until archaic manual systems are automated. Individual and unit training requirements data are particularly noteworthy as candidates for automation. Funding requests for these systems can be justified as meeting both an operational peacetime need and a war planning need.

• **Revise its primary mobilization policy guidance by rewriting chapter 9 of volume III of the *Army Mobilization and Operations Planning System*.*** The Army and Defense Department have initiated a number of programs which fundamentally change the atmosphere of mobilization planning. The Joint Industrial Mobilization Planning Process and Graduated Mobilization Response are only two of the current initiatives. The Army guidance for total mobilization planning must be rewritten to properly link these and other processes with each other and with MOBNET.

Army Mobilization and Operations Planning System, Volume III, "Army Mobilization and Deployment Planning Guidance," Chapter 9, "Total Mobilization Planning" (Office of the Deputy Chief of Staff for Operations and Plans, June 1988).

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ACRONYMS AND DEFINITIONS

AIASA	Annual Integrated Assessment of Security Assistance
AIIQ	Ammunition Initial Issue Quantity
AMC	U.S. Army Materiel Command
AMOPS	Army Mobilization and Operations Planning System
ARPRINT	Army program for individual training
ARTEP	Army Training and Evaluation Program
ATRRS	Army Training Requirements and Resources System
CAA	U.S. Army Concepts Analysis Agency
CBS-X	Continued Balance System Expanded
CEESC	U.S. Army Corps of Engineers, Engineer Studies Center
CINC	commander-in-chief
CONPLAN	concept plan
CONUS	continental United States
DA-CIL	Department of the Army Critical Items List
DLA	Defense Logistics Agency
DoD	Department of Defense
DSS	decision support system
ESC	U.S. Army Engineer Studies Center
EXPLAN	exercise plan
FAA	functional area assessment
FORMDEPS	U.S. Army Forces Command Mobilization and Deployment Planning System
FORSCOM	U.S. Army Forces Command
HSC	U.S. Army Health Service Command
IPP	industrial preparedness planning
ITAC	Intelligence and Threat Analysis Center
ITMS	Integrated Training Management System
JCS	Joint Chiefs of Staff
JIMPP	Joint Industrial Mobilization Planning Process
LOGNET	Logistics Network
M-day	the first day of mobilization
MDSS	mobilization decision support system
MEDCOM	U.S. Army Medical Command
MEPCOM	Military Entrance Processing Command
MESAR	Minimum Essential Security Assistance Requirement
MOBARPRINT	mobilization Army program for individual training

MOBARPRINT-X	mobilization Army program for individual training--expanded
MOBERS	Mobilization Equipment Redistribution System
MOBEX	mobilization exercise
MOBNET	Mobilization Network
MOBPOI	mobilization programs of instruction
MOBSCOPE	Mobilization Shipments Configured For Operational Planning and Execution
MOBTDA	mobilization table of distribution and allowances
MOS	military occupational skill
MRFS	Mid-Range Force Study
MTMC	U.S. Army Military Traffic Management Command
NATO	North Atlantic Treaty Organization
ODCSOPS	Office of the Deputy Chief of Staff For Operations and Plans
ODCSOPS-FD	Assistant Deputy Chief of Staff For Operations and Plans, Force Development
OMNIBUS	a theater-level war study
OPLAN	operation plan
OSD	Office of the Secretary of Defense
PBA	Production Base Analysis
PEPTP	Production Equipment Package Transportation Plan
PFCA	Program Force Capability Assessment
TAEDP	Total Army Equipment Distribution Program
TBEP	Training Base Expansion Plan
TDA	table of distribution and allowances
TOE	table of organization and equipment
TPFDD	Time-Phased Force Deployment Data
TRADOC	U.S. Army Training and Doctrine Command
USACE	U.S. Army Corps of Engineers
USASAC	U.S. Army Security Assistance Center

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...Despite this book's abiding interest in tracing the "larger tendencies" in world affairs over the past five centuries, it is not arguing that economics determines every event, or is the sole reason for the success and failure of each nation. There simply is too much evidence pointing to other things: geography, military organization, national morale, the alliance system, and many other factors can all affect the relative power of the members of the states system. In the eighteenth century, for example, the United Provinces were the richest parts of Europe, and Russia the poorest--yet the Dutch fell, and the Russians rose. Individual folly (like Hitler's) and extremely high battlefield competence (whether of the Spanish regiments in the sixteenth century or of the German infantry in this century) also go a long way to explain individual victories and defeats. What does seem incontestable, however, is that in a long-drawn-out Great Power (and usually coalition) war, victory has repeatedly gone to the side with the more flourishing productive base--or, as the spanish captains used to say, to him who has the last escudo...

Paul Kennedy, ***The Rise and Fall of the Great Powers*** (Vintage Books, 1987), page xxiv.

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ARMY SYSTEM FOR MOBILIZATION REQUIREMENTS PLANNING SUPPLY CLASSES V AND VII (AMMUNITION AND EQUIPMENT)

I. INTRODUCTION

1. **PURPOSE.** This report outlines a planning system for estimating the materiel requirements to support a mobilization of the United States Army. The system can be applied to any level of mobilization, ranging from a world-wide military confrontation between super powers to a more limited regional deployment to secure modest political objectives.

2. **SCOPE.** This analysis defines the components of a system for determining the mobilization requirements for Army-managed items of ammunition (Class V) and equipment (Class VII).[1] This is the fifth of a series of reports produced as part of the same study effort. The first four study reports addressed processes, both active and under development, for determining materiel requirements to support:

a. The active and reserve components comprising the current force.

b. Additional units to expand the size of the U.S. Army beyond its approved strength.

c. The Army's continental United States (CONUS) base.

d. Allied and friendly forces.

3. **LIMITS.** This analysis presents a method to determine requirements for Class V and Class VII materiel items which are managed by the *Army*. It does not address requirements in other fields of interest such as manning, stationing, training, or deploying. Nor does it address requirements for materiel which the Department of the Army does not manage. However, in estimating equipment and ammunition requirements, the system will access a variety of data bases which, with some additional effort, could provide the basis for mobilization planning in other fields of interest.

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[1]The Army recognizes ten classes of supply:
Class I - Subsistence
Class II - Clothing and individual equipment
Class III - Petroleum, oil, coolants, and lubricants
Class IV - Construction materials
Class V - Ammunition and missiles
Class VI - Personal demand items
Class VII - Major end items of equipment
Class VIII - Medical material
Class IX - Repair parts
Class X - Materiel for non-military programs.

4. **STUDY BACKGROUND.** In October 1985, Headquarters, Department of the Army, identified 30 Army staff issues or problem areas which required research. The Army Study Program Management Agency later used nine of these issues as a basis for guiding Army studies and analyses for the 1987 fiscal year. Because of its extensive experience in mobilization studies for the U.S. Army Corps of Engineers (USACE) and its earlier involvement in Army-wide mobilization exercises, the Engineer Studies Center (ESC) was uniquely qualified to lead the overall Army mobilization study effort.[2] It only remained to find a sponsor within the Army staff or secretariat.

a. In early 1987, ESC representatives met with representatives of the Operations Readiness and Mobilization Directorate of the Office of the Deputy Chief of Staff for Operations and Plans (ODCSOPS) to identify current problems that need dedicated analytic support. Subsequent meetings revealed that an accurate, comprehensive determination of the materiel requirements critical to the mobilization, deployment, sustainment, and expansion of the Army force structure is essential for further progress in industrial preparedness planning.

b. The transition from peace to total mobilization involves activating the reserve units, activating additional units beyond the approved force structure, and expanding the capabilities of all national resources, including industry, to sustain these forces in combat. In today's economic atmosphere of tight budget dollars, the Congress is skeptical of requests for additional expenditures. Maintaining excessive industrial capacity or large stockpiles of war materiel are planning alternatives that make little headway against the political and economic currents. Requests to finance either of these alternatives must be accompanied by irrefutable data which portray a clear threat to the security of the United States. A necessary first step in developing these data is quantifying the materiel requirements to sustain a total mobilization.

c. The complete equation for industrial preparedness planning must account for not only the total materiel required to *build* and *fight* the force, but also the capability of the industrial base to *produce* materiel. Differences between the two sides of the equation express the industrial base's deficit or excess capability. The system outlined in this report only examines the *requirements* side of the equation. It is left for others to close the planning circuit by developing the capability side of the equation.

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[2] *Mobilization Environments* (U.S. Army Corps of Engineers, Engineer Studies Center [CEESC], November 1979); *Summary Evaluation of MOBEX 80* (CEESC, December 1980); *Evaluation of US Army Corps of Engineers MOBEX 80 Exercise Plan (EXPLAN)* (CEESC, September 1980); *Corps Mobilization Posture* (CEESC, February 1980); *Corps Mobilization Capabilities, Requirements, and Planning* (CEESC, March 1980); *Construction Support for Mobilization: A National Emergency Planning Issue* (CEESC, November 1980); *US Army Corps of Engineers Work Force Requirements for Mobilization* (CEESC, October 1981); *USACE Mobilization Posture Update: 1981* (CEESC, May 1981); *USACE Conceptual Posture for Mobilization* (CEESC, December 1983); *The Current USACE Mobilization Posture* (CEESC, September 1983); *Summary Evaluation of MOBEX-83* (CEESC, January 1983); *A USACE Mobilization Readiness Improvement Program* (CEESC, April 1984); and *Department of the Army Mobilization Policy and Its Impact on Construction Planning* (CEESC, March 1984).

5. **APPROACH.** The Engineer Studies Center has published four reports in support of this final effort (see Figure 1). These preliminary studies collected information which ESC used to develop an integrated planning tool for total mobilization. Three criteria were used to select, from among a plethora of options, the systems and data bases of greatest utility to the mobilization planning process:

a. **Criterion 1: the system or data base is existing and supported.** Throughout this study, ESC tried to locate systems or data bases that either already provided (or could be modified to provide) the output needed by the mobilization planning process. To reduce the amount of time that must be dedicated to their development, ESC favors systems and data bases which are already in use, albeit for other purposes. There is an equally important and, perhaps, more subtle reason for giving favored status to existing systems. Systems and data bases which are maintained for other purposes and enjoy, therefore, the advantages of proponency, are more likely to provide data that are accurate and current.

b. **Criterion 2: the system or data base has a practical peacetime use.** As much as possible, ESC recommended new systems and data bases which were suitable not just for mobilization planning purposes, but also for supporting peacetime operations. The arguments for this criterion are similar to those advanced above, with one addition. If a staff is motivated to devise systems that will help its daily operations, the mobilization community can tap into that enthusiasm early in the development stage to get the results needed to support requirements determination.

c. **Criterion 3: the system or data base is directly linked to its source.** Given a choice between two or more systems or data bases, ESC preferred those managed by the staffs directly involved in the activities which generate the data. This criterion merely ensures that the data used are the most accurate.

Assessment of the Methodologies for Determining Materiel Requirements for the Current Force

This report examines the systems and data bases that are currently used to estimate military mobilization requirements. The scope of the study is limited to processes affecting the current force structure, only. This report serves as a valuable primer for the uninitiated about current planning systems, critical items lists, and consumption rates.

Determining Materiel Requirements for Force Expansion

This report reviews the systems and data bases available for estimating the requirements to build and train new formations beyond the current force structure. This report also is an excellent textbook for reviewing the mechanisms used by U.S. Army Forces Command (FORSCOM) and the U.S. Army Training and Doctrine Command (TRADOC) to plan training needs.

Army Mobilization Materiel Requirements To Support the Continental United States Military Base Structure

This document examines the Army commands which make up the Army activities that remain within the territorial boundaries of the United States during a military conflict. These components include the induction and training activities, the Corps of Engineers, the Army Materiel Command, the health and medical commands, and the transportation commands. Systems and data bases relevant to these activities were surveyed for possible application to the field of mobilization planning.

Wartime Support of U.S. Friends and Allies: An Assessment of the Planning Environment

This final of four preliminary reports detailed the systems and data bases available for estimating materiel requirements for allies and friends. As is true of the other reports discussed above, this report is a compact primer about the U.S. system for foreign military sales and a compendium of resources available to the mobilization planner for estimating non-U.S. materiel requirements.

Figure 1. SUPPORTING STUDIES PUBLISHED BY THE ENGINEER STUDIES CENTER

II. DEFINITION OF MOBILIZATION TERMS

6. **GENERAL.** Eighteen months of research and interviews with persons familiar with the major mobilization issues has revealed a surprising lack of uniform interpretation of terms and phrases. ESC does not suggest that the following are *the* authoritative definitions. They are, however, accurate and provided for the reader's enlightenment. The reader is cautioned, moreover, not to become preoccupied with the question of whether these definitions conform to his or her interpretation of the terms. Rather, they should guide the reader's understanding of this study report.

7. **LEVELS OF MOBILIZATION.** The following three levels of mobilization require detailed explanation to avoid confusion.[3] In particular, the terms *full mobilization* and *total mobilization* frequently are used interchangeably, although they represent two substantially different concepts.

a. **Partial Mobilization.** *Expansion of the active Armed Forces resulting from action by Congress (up to full mobilization) or by the President (not more than 1,000,000 for 24 months) to mobilize Reserve Component units, individual reservists, retirees, and the resources needed for their support, to meet the requirements of a war or other national emergency involving an external threat to the national security. This is the first level of mobilization, at which part or all of the MOBTDA is authorized for implementation.*[4] From the perspective of industrial planning, partial mobilization might require increasing production in certain industries critical to the war effort. If the condition of partial mobilization remains in force over a substantial period of time, additional production facilities might be opened to help cope with increased military demands for specific commodities. Overall, the impact on the civilian sector of the economy is minimal: no reductions in the goods and services available to the civilian sector and no mandatory conservation measures. Both the Korean and the Vietnamese conflicts are examples of a partial mobilization of the United States. Some have argued that the United States has been in a state of partial mobilization since the end of World War II, as exemplified by the Army's relatively large size and forward deployment.

b. **Full Mobilization.** *Expansion of the active Armed Forces resulting from action by Congress to mobilize all reserve component units in the existing approved force structure* **[Current Force]**, *all individual reservists, retired military personnel, and the resources needed for their support to meet the requirements of a war or other national emergency involving an external threat to the national security.*[5] The likelihood that the United States would remain at full mobilization without transitioning to a total mobilization profile is fairly remote. The approved force, fully activated, is designed specifically to fight a global conventional conflict--the JCS "worst case" scenario. Therefore, if the global situation deteriorates to a point where the

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[3]Two additional levels of mobilization are recognized by the Army: Presidential call-up of 200,000 selected reservists and selective mobilization. However, there was little confusion evidenced by their usage. *Army Mobilization and Operations Planning System (AMOPS)*, "Volume I: System Description, Responsibilities & Procedures" (Office of the Deputy Chief of Staff for Operations and Plans, June 1988).

[4]*AMOPS*, Volume I, p. 2-1.

[5]*AMOPS*, Volume I, p. 2-2.

political leadership of the United States believes that full mobilization is warranted, they would more than likely order total mobilization. Full mobilization, then, would be but a *transient* level of mobilization through which the country would pass *enroute* to total mobilization. Based on similar logic, the impact of full mobilization on the industrial base would be indistinguishable from the impact of total mobilization.

c. **Total Mobilization**. *Expansion of the Armed Forces resulting from action of Congress to organize and/or generate additional units or personnel, beyond the existing force structure, and the resources needed for their support, to meet the total requirement of a war or other national emergency involving an external threat to the national security.*[6] This level of mobilization represents the total commitment of the United States' military and industrial might to wage war to a successful conclusion. Industrial production is converted to respond to escalating numbers of military procurement orders. This conversion may take several forms: an administrative decision to raise the priority of Federal-over-public needs; retooling peacetime production lines to produce war materiel; or building new plant facilities and production lines to accommodate war fighting requirements. The impact of total mobilization on the public is felt through commodity shortages and increased prices in the retail markets, increased competition for labor between industries, increased emphasis on jobs in the heavy and medium industries at the expense of the service industry, and, of course, induction of millions of the nation's young into the Armed Forces. The full impact of these consequences, typically, does not surface until well into the mobilization time schedule. However, some impact may be felt almost as soon as a total mobilization is declared.

8. **CURRENT FORCE.** The current force consists of all approved forces in the active, reserve, and national guard components of the Armed Forces, plus those unresourced units necessary to provide the Army with its full complement of combat support and combat service support elements. The procedures planned to bring unresourced units up to operational levels of readiness and strength are similar to those procedures that will likely be needed to bring new units into the force. Many of those interviewed during the research for this study referred to the process of adding these unresourced units to the force as *force expansion*. This study carefully distinguishes between the activities needed to bring the full current force to bear and those associated with force expansion.

9. **FORCE EXPANSION.** Force expansion is the process of building *new* units to increase the size of the current force beyond its approved strength. The ultimate force structuring goal of force expansion is as yet undefined and, very likely, will vary according to the specific requirements of the operation plan (OPLAN) or OPLANs being executed at the moment mobilization commences. Force expansion activities include recruiting soldiers, processing and training them, supplying them with equipment, forming them into military units, and, after deploying the units to the theater of operations, sustaining them during combat.

10. **INDUSTRIAL SURGE.** Industrial surge is defined as the latent capability of a single industry or a group of industries to increase its production of a commodity. Industrial surging is an inherent capability in the sense that production can be increased without purchasing new

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[6] *AMOPS*, Volume I, p. 2-2.

plant facilities or production equipment. Surge, at one level, can be accomplished by adding work shifts and increasing the lengths of the work day and work week. At another level, surge capability is acquired by purchasing additional production line machinery excess to peacetime needs and storing it for eventual use during mobilization or other national emergencies. The choice of any surge option is limited by the adequacy of the supply of raw materials and component parts needed to accommodate the increased production. There are at least three uses for surging industrial production capability:

a. **Crisis Support for Friends or Allies.** Industry can surge to replenish war reserve stocks that have been reduced through decisions by the United States to supply emergency war materiel needs to friendly or allied forces. A recent illustration is the 1973 Arab-Israeli war, during which the United States supplied equipment and munitions to Israel, virtually depleting the U.S. war reserves in Europe. Over the next 3 to 4 years, industry surged its production to build the reserves back to pre-conflict levels.

b. **Crisis Support for U.S. Contingency Actions.** Industry can surge to replenish war reserve stocks that have been reduced through decisions to support forces of the United States engaged in military actions in theaters not explicitly covered by the war reserve regulations.

c. **Crisis Preparation.** Industry can surge to increase war reserve stocks or unit equipment fill in response to escalating tensions or strategic warning. Surge capability, in this instance, is exercised in compliance with the policy of the National Security Council to incrementally increase the mobilization posture of the United States in response to escalating threats to its national security.[7]

11. **INDUSTRIAL EXPANSION.** The difference between industrial surge and industrial expansion is analogous to the difference between full and total mobilization discussed above. The expansion of the industrial base of the United States is realized by acquiring *new* facilities and capital equipment and hiring new management and labor. Expansion is also accomplished by retooling machinery used to produce commercial goods into machinery capable of producing essential war materiel. Actions necessary to expand the industrial base are resource-intensive and time-consuming. Many of the processes to produce technologically advanced weapons require several months or years to duplicate.

12. **COALITION WARFARE.** In the strictest sense, the term coalition warfare describes conflict by two or more nations which have deployed military forces in cooperation against a common foe. Coalition partners may be bound by an agreement only to strive towards defeating the enemy, each reserving autonomous direction over the political goals and military operations of its forces. At the other end of the spectrum, coalition partners may agree to subordinate operational control of their military forces to another partner. During the last few

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[7]The illustrative uses for surge capability were taken from a draft paper prepared by Dr. Jay Mandelbaum entitled, *Sustainability Funding/Investment in the US (NATO) Industrial Base (U)*, prepared for the Office of the Assistant Secretary of Defense for Production and Logistics in 1988.

decades, the United States has also been involved with two other forms of coalition warfare, both of which were examined as part of this study.

a. **Foreign Military Operations.** The United States has provided substantial support, short of direct military intervention, to countries conducting military operations to further their own political aims: Israel against her Arab neighbors and Great Britain against Argentina are recent examples.

b. **Insurgency Operations.** The United States has also supported insurgency operations against established governments: Afghanistan, Angola, Kampuchea, and Nicaragua are illustrative.

III. REQUIREMENTS-BASED AND CAPABILITY-BASED PLANNING

13. INTERPRETATION OF THE CONFLICT. A debate has raged within the mobilization community over how best to plan for bringing the industrial might of the United States to a wartime footing. Should planners concern themselves with measuring wartime requirements or industrial capability? In the final analysis, an effective planning system must compare the requirements to conduct war against the capability of industry to provide needed materiel. The result of the comparison defines the shortfall that is the basis for follow-on planning. Therefore, both elements are essential to the planning process. However, one side in the debate argues that requirements must be estimated first and used as a baseline to adjust industrial capability through industrial preparedness planning. Others argue in opposition that industrial capability should be measured first and used as a baseline to adjust military operations plans and, thereby, reduce materiel consumption to a level commensurate with industrial capacity.

a. **Requirements Analyses.** The requirements-side analyst examines the materiel needs of a force unconstrained by public financial limitations and industry production ceilings. Within an acceptable level of risk, this force is designed to execute the nation's strategic goals[8]. Estimates of the wartime expenditure of materiel provide a measuring stick with which the analyst can anticipate the size and mix of industrial capability needed to successfully prosecute a war. By comparing needed capability to existing industrial base capacity, the analyst can define the production shortfalls. The analyst can then plan to increase the production capacity of the nation to meet the identified need. *The underlying tenet of the requirements-side analysis is that steps can be taken either before warning of impending war (or once the nation is mobilizing for war) to substantially improve the production capacity of the industrial base.*

b. **Capability Analyses.** The capability-side analyst assumes that the measure of the country's capability to produce materiel is the basic building block for mobilization planning. Political goals, strategic objectives, and operational plans must be modified to comport with the materiel support limitations imposed by a constrained industrial production capacity. *The fundamental principle of the capability-side analysis is that, except in the very long term, nothing can be done to substantially change the production capacity of the nation if called to support critical wartime needs.*

c. **Requirements Versus Capability Analyses.** Which analysis approach is better? Most likely, the "best" method is found somewhere between the two points of view. Moreover, as inferred from above, it is sensitive to time. Given enough time, the nation *can* act to improve its wartime industrial posture. On the other hand, if action is delayed until war is imminent, little can be done to quickly influence production capacity. The ability to improve capacity is proportional to the amount of time available. From a planning standpoint, then, the requirement-based analysis enjoys the advantage during the pre-conflict period. As the

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[8]At present the Joint Chiefs of Staff (JCS) Planning Force defines the minimum force necessary to achieve the strategic goals of the United States. The *Defense Guidance* directs planners to base sustainability plans on the "...force apportionment guidance provided by the Joint Chiefs of Staff."

commencement of hostilities approaches, requirements-based analysis gives way more and more to capability-based analysis. Finally, when war begins, capability-based analyses dominate the early months of the conflict.

14. **PLANNING FOR THE EARLY WAR.** The production capacity of the United States when the war begins--that is, the industrial manufacturing capacity that exists just before mobilization plus the industries' capacity to surge production--will be the industry's production limit until new plant facilities can be opened. Therefore, requirements estimates are of secondary importance for early war planning. Although requirements in excess of the capacity of the industrial base might be the cause of anxiety at the highest levels of the government, little can be done to increase production immediately. Excessive requirements serve primarily as indicators of a need to curb operational plans and mobilization activities to accommodate production limitations. Industry mobilization plans executed during the early weeks of the war, therefore, have little influence on production capacity--at least during the first 6 to 18 months (in some cases, longer).[9] Therefore, capability-based planning, on an individual industry basis, is and should be the war planner's basis for developing mobilization plans and war plans for the early war. The ability of the United States to prosecute a major conventional war, in this environment, is clearly defined by the amount of war materiel on hand (war reserve stocks and combat issue) and the maximum production levels of industry (including, of course, any foreign sources which agree to supply U.S. needs).

15. **PLANNING FOR THE LATE WAR.** Industrial mobilization plans to support a conventional war which continues beyond 18 months should be requirements-driven. Actions to mobilize the nation's economy at the war's beginning will start to bear fruit during later months of the war. As a result, the capability of the industrial base supporting the war at year 2, 3, or later of a mobilization will bear little resemblance to the industrial capability that existed on the day the nation began to mobilize. New industrial plants will have begun production. New weapons and new war-fighting doctrine will demand different kinds of support from industry. The processes required to create this new industry configuration must be begun as soon as possible after mobilization commences. The question faced by planners is "*What actions must the United States begin at M-day to achieve the industrial base needed at M+2 years and beyond?*" The answer most clearly depends on what type and amounts of materiel the industries will be asked to produce: a *requirements-based* analysis.

16. **PRE-MOBILIZATION PLANNING AND EXECUTION.** The perspective from which either an early-war or a late-war analysis is begun depends on how the industrial base is configured when mobilization begins.

a. **Early War.** The link between the M-day industrial base and capability-based planning for the early war is obvious: the industrial base that exists on the day mobilization begins will define the nation's production capability throughout the early war months. If that

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[9]For example, staff at the U.S. Army Industrial Base Engineering Activity at Rock Island, Illinois, part of the U.S. Army Materiel Command, estimate that about 18 months would be required to open a new M-1 tank plant.

capability is insufficient to the task, combat operations will have to be modified to lessen the drain on a straining economy and industry.

b. **Late War.** To develop workable mobilization plans for the late war, the industrial planner must postulate the size and production mix of both the future industrial base and the M-day industrial base. The differences between these two configurations characterize the late-war planning needs. To prepare for the late war, then, the planner must, first, have the M-day configuration.

c. **Middle War.** The M-day industrial base, coupled with the war reserve stockpiles, must have the capacity to support the current force through the several months of the early war. The size of the war reserves is defined by the relationships between the requirements to sustain military action, the capacity of the M-day industrial base, and the time necessary to add capacity to the base. The industrial capability at M-day, therefore, is information that is crucial for determining the size of the nation's war reserves. The smaller the capacity at M-day, the larger the war reserves must be to sustain the force until new capacity can be added.

d. **Interdependency of Planning Efforts.** As the combat power of the Army's peacetime forces is improved by new weapons systems, force restructuring, and changes to combat doctrine, the configuration of the industrial base must also be changed to provide the type and number of munitions and materiel now needed to sustain combat power. Further, because the United States can never predict with certainty when mobilization will occur, incremental changes in the force structure and operational plans must be accompanied by incremental changes in the industrial base. Only this way can the nation be assured that the Army has the requisite industrial base to support its combat operations. Modern, state-of-the-art machines of war are useless without ammunition and repair parts. *Force structure planning, operational planning, and mobilization planning must be inexorably linked to one another. Changes in one must be accompanied by changes in the others.*

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IV. PROBLEMS WITH THE CURRENT REQUIREMENTS DETERMINATION PROCESS

17. **GENERAL.** The processes used to estimate the materiel requirements to support war plans and mobilization have serious imperfections. Because the military doctrine that dominated U.S. superpower relations from the 1950's through the 1970's stressed a nuclear response to aggression, the inadequacies of support plans for conventional war were never a focus of Army concern. The United States' announced policy to escalate a conflict to an exchange of strategic nuclear weapons suggested that future wars would be short and very destructive. Therefore, motivation to plan for mobilizing U.S. resources for an extended conventional conflict was lacking at all levels of the military establishment. Carl Builder, however, offers a persuasive counter-argument:

> ...to say that a modern conflict is likely to be too short to mobilize societal resources is not the same as being sure that it will not be protracted -- just as the likelihood of nuclear war escalating to societal destruction does not rule out the important possibility of its remaining limited.[10]

Recently, military planners, agreeing with Builder's statement, are increasingly alarmed that a global confrontation might well remain conventional and that the United States is woefully unprepared to weather such a struggle. In the wake of continuing nuclear arms control negotiations, the likelihood of a global conventional struggle is increased. The Army must take the first step in preparing for such a conflict. To do this, it needs a comprehensive, *cohesive* method for determining credible requirements for the materiel needed to field the requisite forces.

18. **DEFINING THE REQUIREMENTS DETERMINATION IMPASSE.** Forecasting the requirements to support wartime objectives is not as simple today as it appears to have been in the days of Sun Tzu, who said that "...generally, operations of war require one thousand fast four-horse chariots, one thousand four-horse wagons covered in leather, and one hundred thousand troops in mail."[11] The modern mobilization planning process is highly complex and generally not well understood, although it is generally agreed that mobilization requirements should act as a road map for industrial preparedness planning, which in turn should guide national security planning.[12] However, if requirements exceed the expected industrial production, policy makers need to consider adjusting the political or the military objectives, or allocating resources to improve the capacity of the industrial base. Alternatively, they must accept a high risk of failure and the consequences to the nation that such a failure implies.[13]

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[10]Builder, Carl H., *Strategic Conflict Without Nuclear Weapons* (RAND Corporation, 1983), p. 17.

[11]Gill, Timothy D., *Industrial Preparedness: Breaking with an Erratic Past* (National Security Affairs Monograph Series 84-6, 1984), pp. 45-47.

[12]*Industrial Preparedness*, pp. 45-47.

[13]*Industrial Preparedness*, pp. 45-47.

a. Although credible materiel requirements are vital to the planning process, arriving at an agreed upon definition of "credible" is an exercise that, historically, has been difficult. The Army's peacetime industrial preparedness planning (IPP) attempts to establish and maintain a strong defense industrial base, with enough "surge" flexibility to meet the materiel needs of a military conflict until industry gears up to wartime production.

b. The reality of modern IPP, however, is far from this ideal. Even though the Army's IPP policies were revised in the past 15 years to make the determination of *production* requirements the foundation of the Army's IPP program, this vital planning function is still seriously flawed.[14]

19. **INCONSISTENCY IN DETERMINING REQUIREMENTS.** The flaws in the Army's IPP process fall into three general categories: inconsistency in determining requirements; use of a questionable planning baseline; and failure to adequately disseminate requirements data.

a. **Requirements Accounting Is Incomplete.** Today, the Army has no way of accurately measuring how much materiel it will need to support building, training, and sustaining an expanded force--not only the new formations deploying to the theater of operations but also those remaining within the boundaries of the United States. Further, the process now fails to consider the possible requirement to support non-U.S. forces whose survival is crucial to the nation's objectives. Either requirement, taken alone, could levy a large, perhaps impossible, demand on the industrial base. Ignoring even one of them when determining potential requirements presents a distorted picture of the total demand on the U.S. industrial base in wartime.

b. **Requirements Fluctuate.** The Army's formal tally of its materiel requirements can fluctuate rather wildly from year to year as the Army changes or modifies its force structure, modernizes its weapons systems, deploys in new areas of the world, or adopts new combat doctrine. Since force structure, weapons systems, deployment options, and combat doctrine are all key elements of the assumptions which drive the Army's automated planning models, the part of the models' output of interest to mobilization planners--the compilation of the amount of materiel the Army will need to win--continually changes. Although fluctuating data do make planning difficult, such fluctuations reflect the maturation of the nation's political goals and military plans. If the input data and the modelling algorithms reasonably simulate battlefield and political reality, they should not be modified merely to fulfill a planners desire for data stability. However, since past studies of the IPP process have concluded that successful plans cannot be made in an environment of radically fluctuating requirements, modelers and wargamers must find a way to accommodate the needs of the mobilization planners for relatively stable requirements data.[15]

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[14]*Industrial Preparedness*, pp. 46-47.

[15]See Vawter, Roderick L., *Industrial Mobilization: The Relevant History*, and Timothy D. Gill, *Industrial Preparedness: Breaking with an Erratic Past*, both published by National Defense University Press.

c. **Materiel Items Tracked Are Of Questionable Criticality.** The traditional IPP process begins with the publication of the Department of the Army Critical Item List (DA-CIL). The DA-CIL identifies the items and the sustaining production rates that are required after month 6 for the *current* Army force. About 500 items are identified from the DA-CIL. This list is expanded to about 2,000 items which are placed on the IPP list. The IPP list then serves as a guide for gathering mobilization production schedules from industry for further comparisons to the demands. Items shown on the DA-CIL should be listed because they are considered critical to winning the battle. In many cases, however, items are listed for less crucial reasons--in some instances because their shortage affects peacetime readiness reports. Some years ago, for example, a significant shortage of radiation dosimeters was remedied when the Army Materiel Command invested in a large increase in dosimeter procurement. The dosimeter shortage had been reflected on the DA-CIL as a demand. Although the extraordinary purchase of dosimeters removed that item from the DA-CIL and improved the readiness posture of many units, *it did nothing to improve the capability of the Army to fight a sustained conventional war*--the fundamental planning purpose for the DA-CIL. Though anecdotal, this incident is symptomatic of a pivotal flaw in the planning process.

20. **QUESTIONABLE BASELINE PLANNING DATA.** Congress has mandated that Department of Defense tie its measurements of its war fighting requirements to national objectives, as outlined in the *Defense Guidance*. Under the conditions of *global* conventional war, it is unlikely that either the current force or the program force could secure those objectives. *By definition*, the planning force defined by the Joint Chiefs of Staff (JCS) is the minimum force necessary to meet national goals in a global conflict. Logic dictates that IPP should, at the very least, *consider* the requirements to support the planning force.

a. A considerable portion of the Army's mobilization planning effort has focused on the requirements to support full mobilization of the current force. Although a number of reputable studies have addressed the implications of expanding the force, the Army has not yet developed a strategy for transitioning from a peacetime structure to total mobilization. As a result, IPP concentrates on assessing the capability of the industrial base to meet full mobilization requirements--and thus, technically, does not fulfill the Congressional mandate.

b. The Secretary of Defense has called on the Services for detailed plans to expand the force structure beyond current force levels--beyond full mobilization. The JCS planning force is used by both the *Defense Guidance* and the *Army Mobilization and Operations Planning System* as the baseline force for total mobilization planning. As a planning tool, the planning force is a suitable standard against which expansion plans can be measured. More important, however, the Department of Defense-directed planning force ensures that the services begin their total mobilization planning from a common baseline force structure. From a war plans perspective, it makes eminently more sense to plan for mobilizing a force which enjoys some probability of success. Plans for mobilizing the current or program force which, constrained by peacetime political and economic conditions, have little likelihood of achieving success on a *global* battlefield cannot be justified. The demands of the planning force, compared to the nation's industrial capability, measures the deficit and the subsequent risk to the nation. A similar comparison of either the current or program forces to industrial capability provides no additional risk information--in this case, the base force, from a purely war plans perspective, places the nation at unacceptable risk.

c. Many in the Army still agree with the observation that the Army's "...present war reserve requirements determination system for ammunition, equipment, and fuel has evolved into a complex, unresponsive, and misunderstood process that produces large requirements which are not fully understood by all."[16] The combat loss rates and the consumption rates which evolve from this system (specifically, the program or P-studies) are used to support a number of the Army's programming activities, including IPP. The force development staff of ODCSOPS, in conjunction with the Concepts Analysis Agency, is developing an improved method for setting suitable rates for use by others in the planning community. Since these rates will help define the demand on the industrial base for war materiel, they must therefore be acceptable to mobilization planners as well.

d. ESC found that much of the Army's source data lack validation, standardization, or automation. This is particularly true of the Army's training data, where materiel support requirements are estimated through highly subjective manual calculations. Further, no baseline data exist to plan force expansion requirements. The absence or inaccessibility of such crucial data makes computation for mobilization planning impossible.

21. **FAILURE TO DISSEMINATE REQUIREMENTS DATA.** Because the Army's data base for war fighting requirements is inconsistent and fragmentary, few requirements data are suitable for use by other agencies in their national-level mobilization planning. Obviously, the Army cannot disseminate requirements data it does not have. However, until acceptable requirements data are available, national security preparedness suffers.

a. The Commission on Integrated Long-Term Strategy stated in its final report, *Discriminate Deterrence*, that the government needs better ways of spending the money in the current environment of "...stop and go..." budgeting. The Commission believed that Department of Defense should develop the capacity to expand production of critical equipment, and to stockpile long-lead time items that might represent bottlenecks in a mobilization buildup. They also thought that, with proper planning, United States industry could build sizable surge capabilities from relatively modest investments. The Commission suggested that the key to such successful plans is clearly defined requirements linked to a coherent national strategy; in particular, the Commission believed that requirements estimates *must* be guided by a long-term strategy if the United States is to get the most out of a given budget.[17] (Under Executive Order 12656, military requirements must be passed to Federal civilian agencies to influence national plans for increasing private sector production of raw materials, semi-finished commodities, components, and end items.[18])

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[16] Schwarzkopf, H. N., *War Reserve Requirements Process* (Message, Office of the Deputy Chief of Staff For Operations and Plans, April 1988).

[17] Ikle, Fred C. and Albert Wohlstetter, The Commission On Long-Term Integrated Strategy's Final Report, *Discriminate Deterrence* (Superintendent of Documents, U.S. Printing Office, January 1988), pp. 61-69.

[18] *Executive Order 12656 of November 18, 1988*, "Assignment of Emergency Preparedness Responsibilities" (Federal Register Vol. 53, No. 226, November 23, 1988), pp. 47497-9.

b. The commission's findings supported the results of the Defense Science Board's 1986 review of the management of the acquisition of conventional munitions. The Board reported that acquisition management by the military services left much to criticize. In particular, it characterized the processes used to determine requirements for stockpiling munitions as "...flawed at best..." and concluded that requirements are understated and underfunded.[19] The 1986 Defense Science Board review is just one of a long list of government and private sector analyses of Department of Defense processes for mobilization and industrial preparedness planning. Figure 2 contains extracts of the findings and conclusions from many of these other major analyses.

c. The requirements determination impasse has existed for quite some time. With minor exceptions, the statements in Figure 2 still accurately characterize the state of Army mobilization requirements planning. To break the impasse, the Army must institutionalize a methodology for determining credible requirements data. In those areas where there are data voids the Army must allocate resources to develop data which are accessible by the adopted measuring system. Without dedicated resources and high-level Department support, the Army and Department of Defense will remain unable to:

(1) Comply with stated guidance objectives.

(2) Define the limits of Army mobilization potential.

(3) Enhance industrial preparedness planning.

(4) Develop executable OPLANS--especially those requiring some form of force expansion.

(5) Establish a viable conventional deterrent.

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[19]Kassing, David, *Assessment of Munitions Planning by the Services* (The RAND Corporation, January 1987), p. iv.

Year	Entity	Comment
1952	Army Field Manual 101-53	*Consideration of the relationship of the mobilization plan to the war plan and to program development inevitably brings up the problem of requirements versus capability.*
1970	Joint Logistics Review Board	*...poor mobilization requirements...*
1976	Defense Science Board	*...inadequate industrial mobilization planning...*
1980	Ichord Committee	*If we plan for a short war and make no plans for a long war, then surely all future wars will be short.*
1980	Defense Science Board	*...lack of an adequate basic industrial capacity based on inadequate government [requirements] planning...*
1983	Mobilization Concepts Development Center	*...persistance of the difficulty in defining requirements...*
1984	Army Logistics management Center	*The Army has no prescribed systematic method or procedure for computing, submitting, reviewing and validating mobilization materiel requirements.*

Figure 2. SELECTED COMMENTS FROM PAST REPORTS

Year	Entity	Comment
1986	Mech/Armor Production FAA	*...lack of authoratative industrial mobilization requirements undermines the current mobilization planning system.*
1987	OSD Management Study Team	*Requirements are the baseline for setting equipment and materiel aquisition and industrial base funding objectives.*
1988	Air Force Association	*Government programs fall far short of answering the requirements of the U.S. industrial base.*

Figure 2 SELECTED COMMENTS FROM PAST REPORTS (CONTINUED)

V. THE REQUIREMENTS DETERMINATION SYSTEM

22. **GENERAL.** MOBNET is a requirements determination process which uses data from a variety of decision support systems and data bases. Although the process was conceived to measure requirements for a total mobilization of the United States in response to a European conventional war, its design accommodates an infinite number of mobilization postures and conflict scenarios.

23. **OVERVIEW OF THE SYSTEM.** Figure 3 is a simplified schematic display of the building blocks of the MOBNET system. Annex A of this report provides a detailed view of the component decision support systems and data bases used to support the overall process. For convenience, mobilization requirements are examined from the perspectives of five major military claimants.

a. The current force structure includes a substantial number of units which lack the equipment, personnel, or training necessary to be rated fully combat ready (readiness category ALO-1). Some units, in fact, exist only as paper authorizations and have *no* assets or personnel assigned (the so-called COMPO-4 units).

b. Similarly, Department of Defense plans call for the addition of several Army combat and supporting formations to expand the size of the force from its current structure to one that has a reasonable chance of executing the Army strategic mission. Class V and VII materiel will be necessary to assemble, train, and, of course, sustain each new unit.

c. As the size of the theater combat force structure increases, the CONUS support base must also increase its capacity to support the expanding force. Additional training and medical staffs, for example, are needed to keep pace with the swelling Army population. Although not a major consumer of Class V supplies, the CONUS base will be a claimant for substantial amounts of Class VII materiel.

d. Critical allied forces and the other services make up the final two categories of consumers. Both will levy requirements against the industrial base managed by the Army.

24. **USING CURRENT AND DEVELOPING SYSTEMS AND DATA BASES.** MOBNET attempts to utilize data bases and decision support systems which are already in use or which are under development for other purposes. By piggybacking onto such systems, the implementation of MOBNET by the Army staffs can be accomplished with a minimum of disruption to their activities. Where no system exists, ESC inevitably found that a decision support system, usually automated, was essential to improve the daily efficiency of the staff in question. Although the staff work required to implement MOBNET is substantial, the new systems proposed will serve the Army well in other realms besides mobilization planning.

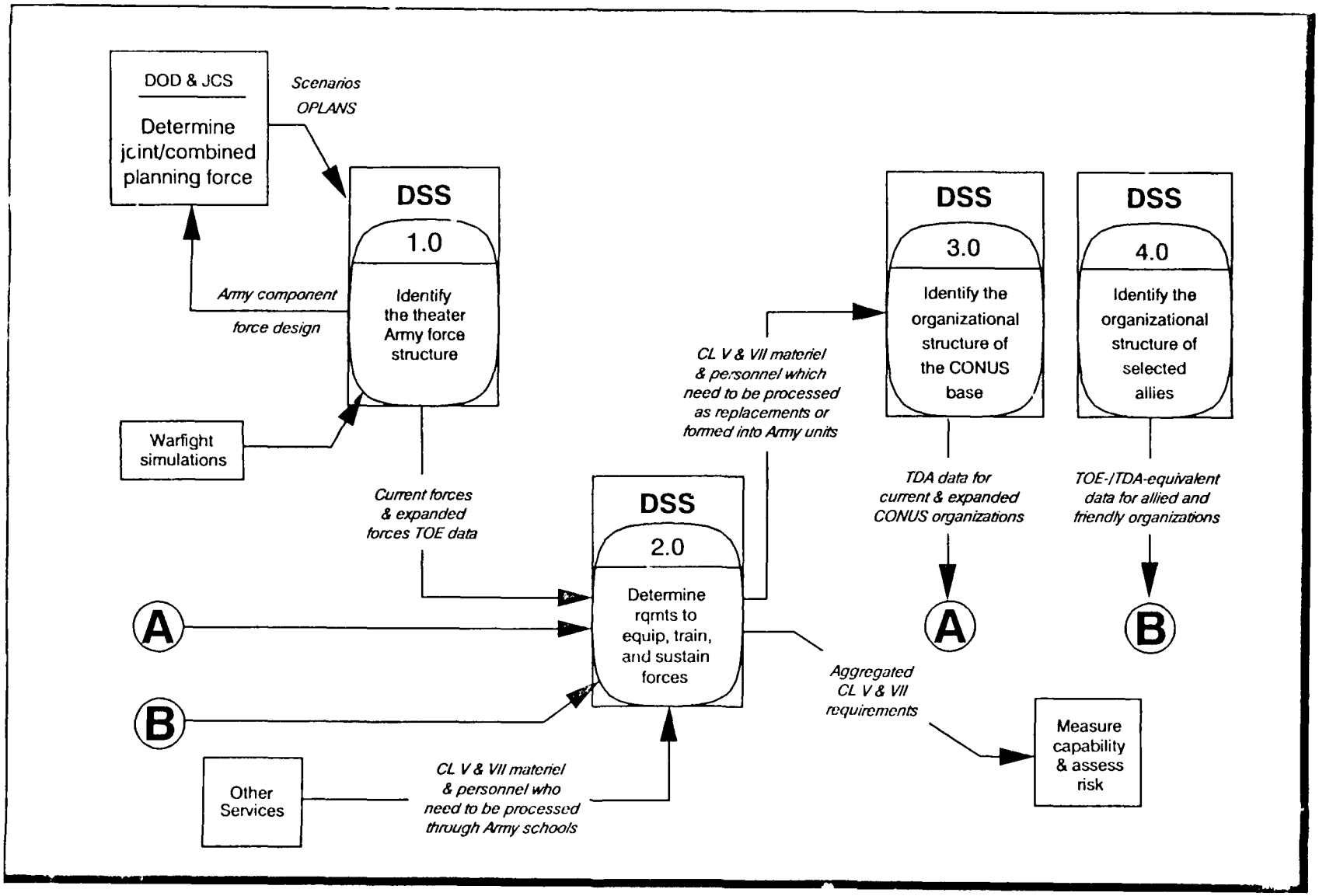

Figure 3. MOBNET SYSTEM OVERVIEW

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VI. CONCLUSIONS

25. **THE ARMY CANNOT DEMONSTRATE CONVINCINGLY THE AMOUNT OF MATERIEL IT REQUIRES TO MOBILIZE AND FIGHT A LONG-TERM CONVENTIONAL WAR.** Although it does a good job of estimating the materiel requirements to mobilize and fight the current force over the short run, the Army has no credible process to measure similar requirements for an expanding force fighting over the long term.

a. Much of the Army's planning efforts over the years has gone into measuring the requirements to deploy and fight the current force. Little of the Army's past efforts, on the other hand, has been concerned with expanding the current force and conducting combat operations beyond 6 months. In the arenas of force expansion and long-term conventional warfare, much of the Army's planning is based on conjecture or inappropriate generalizations of requirements. The Army may have legitimate concerns about the ability of the nation's industrial base to support long-term conventional wars. However, in response to Congressional requests for data to support requests for funding of improvements to the industrial base, the Army offers little more than supposition.

b. Credible materiel requirements, once determined, must be provided to the industrial preparedness planners. Further analysis is necessary to measure the capability of the industrial base to produce needed materials. The Army Materiel Command has made some strides in measuring industrial capacity, as has the Federal Emergency Management Agency. However, much work remains to be done. Industrial capability is extremely difficult to measure, but knowledge of the nation's production capability is crucial for competent war planning.

c. The comparison of the requirements to support war plans to the industrial capability to produce war materials is the essential underpinning of all national strategies. If the industrial base is incapable of supporting existing war plans, then national alternatives are clear and limited.

(1) The nation can allocate resources to improve the wartime posture of the industrial base--adding production lines, increasing war reserves, enhancing the capacity of existing production lines, or buying access to foreign sources of production.

(2) The national political leadership can limit the nation's strategic objectives and, thereby, restrict its exercise of military power so as to conform to the production limits of the industrial base.

(3) The least desirable alternative is to continue planning to accomplish strategic goals with military forces which cannot be supported by the industrial base.

26. **MUCH OF THE DATA NEEDED TO ESTIMATE MOBILIZATION REQUIREMENTS IS NOT AUTOMATED.** The lack of automation places a substantial staff burden on those asked to contribute data for analyses--a burden that would only be made worse by the data requirements for MOBNET. The burden imposed by the lack of automation is most evident in the training management processes at Training and Doctrine Command and U. S. Army Forces

Command. Both the Programs of Instruction and the Mission Training Plans contain the munition and equipment needs for each module of institutional and forces training, respectively. Currently, estimates of aggregate requirements are obtained manually at considerable cost in staff resources. These data are clearly candidates for automation--not just for mobilization planning reasons but also for day-to-day operational support needs.

a. The lack of automation increases the likelihood of mathematical errors and omissions when the data are manipulated. The secondary advantage (access speed is the primary advantage) which cries for automation of data is an increased reliability of the data manipulation process.

b. Information exploited through automated means usually leaves behind a clear audit trail. Validating the processes, then, is comparatively easy.

27. **DECISION SUPPORT SYSTEMS MUST BE MODIFIED TO TAKE ADVANTAGE OF THE DATA THAT ARE ALREADY AVAILABLE.** Significant amounts of data needed by MOBNET already exist and are used to support other systems. However, much of the data requires further manipulation or reformatting to be useful to the MOBNET processes. The additional data processing can be handled either by adding code to existing automated systems or by developing post-processors which manipulate the data after they have been supplied by the piggybacked system. Since the Army has begun to view data collection and maintenance as an automated function, and since computer technology can provide low cost support and efficient data handling capability, managers at all levels should be interested in automating their activities. The MOBNET system can benefit from the general inclination to automate.

VII. RECOMMENDATIONS

28. **THE ARMY MUST GET SERIOUS ABOUT MOBILIZATION PLANNING.** The importance of mobilization planning is at least equal to that of force development and force readiness planning. Without mobilization planning, force development planning leads to a force structure which can be neither built nor fought. Without mobilization planning, force readiness planning leads to unrealistic assumptions about the capability of the United States during emergencies to flesh out units with trained soldiers and modern equipment. Moreover, stockpiles of ammunition and replacement parts are sized based on an *Alice-in-Wonderland* logic which assumes that, somehow, industry will be at wartime production levels very quickly. The Army stockpile managers measure their bounty in *days of supply* when, in fact, months will pass before many industries can produce in quantities needed when the stockpiles run dry. Mobilization planning and, especially, mobilization requirements and industrial capability estimates are inexorably linked to force development and readiness planning. Every effort should be made to make mobilization planning an integral part of a planning triad.

29. **ADOPT THE PROPOSED SYSTEM AS THE BASIS FOR TOTAL MOBILIZATION PLANNING.** MOBNET establishes an integrated corpus of decision support systems and data bases which will provide a full accounting of the materiel requirements to support mobilization. Management of the various component systems is retained by their proponent staffs ensuring, as much as possible, the currency of the data. The designed decentralization of the system components also minimizes the burden imposed on the resources of any one staff tasked to support MOBNET. MOBNET will estimate the requirements to support all major claimants for Army-managed Class V and VII supply items. It is worth saying at this juncture that implementation of a viable MOBNET is a long-term goal. The automation of the various data bases will require months of effort. Furthermore, the development of software to link the components will require considerable additional effort marked by much trial and error testing. Once developed, however, MOBNET will be a tremendous planning asset for the Army and will, no doubt, serve as a guide for the other services to develop similar planning tools.

30. **REWRITE CHAPTER 9 OF THE ARMY MOBILIZATION PLANNING SYSTEM.** MOBNET responds to the Army's need for a better planning system. However, the Army's guidance for mobilization planning, also, needs to be modernized to conform to the findings of this and the four supporting reports which comprise this study. Chapter 9 of Volume III of the *Army Mobilization Planning System (AMOPS)* is the definitive text governing Army planning for total mobilization. This document needs to be rewritten to more accurately reflect current Army mobilization planning philosophy.

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ANNEX A

COMPONENTS OF THE REQUIREMENTS DETERMINING SYSTEM:

MOBILIZATION NETWORK (MOBNET)

Figures

1. **Purpose.** This annex describes the specific components of MOBNET, the planning system recommended by the Engineer Studies Center (ESC) for use in determining materiel requirements to support mobilization of the United States Army.

2. **Scope.** MOBNET measures the amount of Class V (ammunition) and Class VII (major equipment end items) needed to support the mobilization of the U.S. Army. It counts only those items of equipment and ammunition procured under the management of the U.S. Army. The system depicted represents a full accounting of mobilization requirements, including those generated to support theater combat forces, CONUS support base activities, and allied or friendly forces.

3. **The Structured Analysis Methodology.** The system outlined by ESC is complex, encompassing numerous component decision support systems and data bases. Responsibility for these component systems and data bases is dispersed across the structure of the Army, making centralized management of the total system a difficult task. The structured analysis method is the best way to show the interrelationships between decision support systems and their requisite data bases.

a. Structured analysis can be viewed as a language which enforces a disciplined approach to expressing complex thoughts.[1] Analyses of large systems are *decomposed* into units whose sizes facilitate clarity and understanding. Theoretically, a system can be decomposed into

its component systems, each of which, in turn, can be decomposed into its component systems, each of which can be decomposed... and so on. The number of charts necessary to satisfy the information needs depends on the level of detail required by the audience. The ESC analysis has not gone below the third tier of decomposition. The level of detail provided by the first three tiers is general enough to assist management of the system by the Army staff and is specific enough to guide further development of supporting decision support systems and data bases within the Army commands.

b. The structured analysis language used by ESC to describe the system components includes only four symbols. These symbols, shown in Figure A-1, define a system decision point, a data flow, a decision point outside the boundaries of the system component under examination, and a data base.

(1) Typically, each system decision point symbol will be annotated with a surrounding box which specifies a decision support system (DSS) used to process the incoming data and generate a data output. Typically, the DSS recommended is automated. However, occasionally, a DSS is proposed which is not now automated and which does not lend itself easily to current automation techniques.

(2) The data flowing out of or into a decision point are represented by an arrow which shows the origin of the data and their destination. Moreover, each arrow is labeled to show those data elements which are essential to the system's operation. Therefore, although a model or a DSS shown in a chart may generate considerable data, only the data pertinent to the requirements estimation processes are shown.

(3) Much of the data needed to determine requirements are developed by models or from DSSs which operate outside the scope of the study. These systems are shown but not decomposed for further analysis.

(4) Data bases provide data to the system and also accept data from the system. A data base which accepts data from one component of the system will typically appear elsewhere within the overall system as a data base which provides data to another component of the system. Although specific data bases may include a myriad of data of importance to other military planning fields, only the data pertinent to requirements determination are identified.

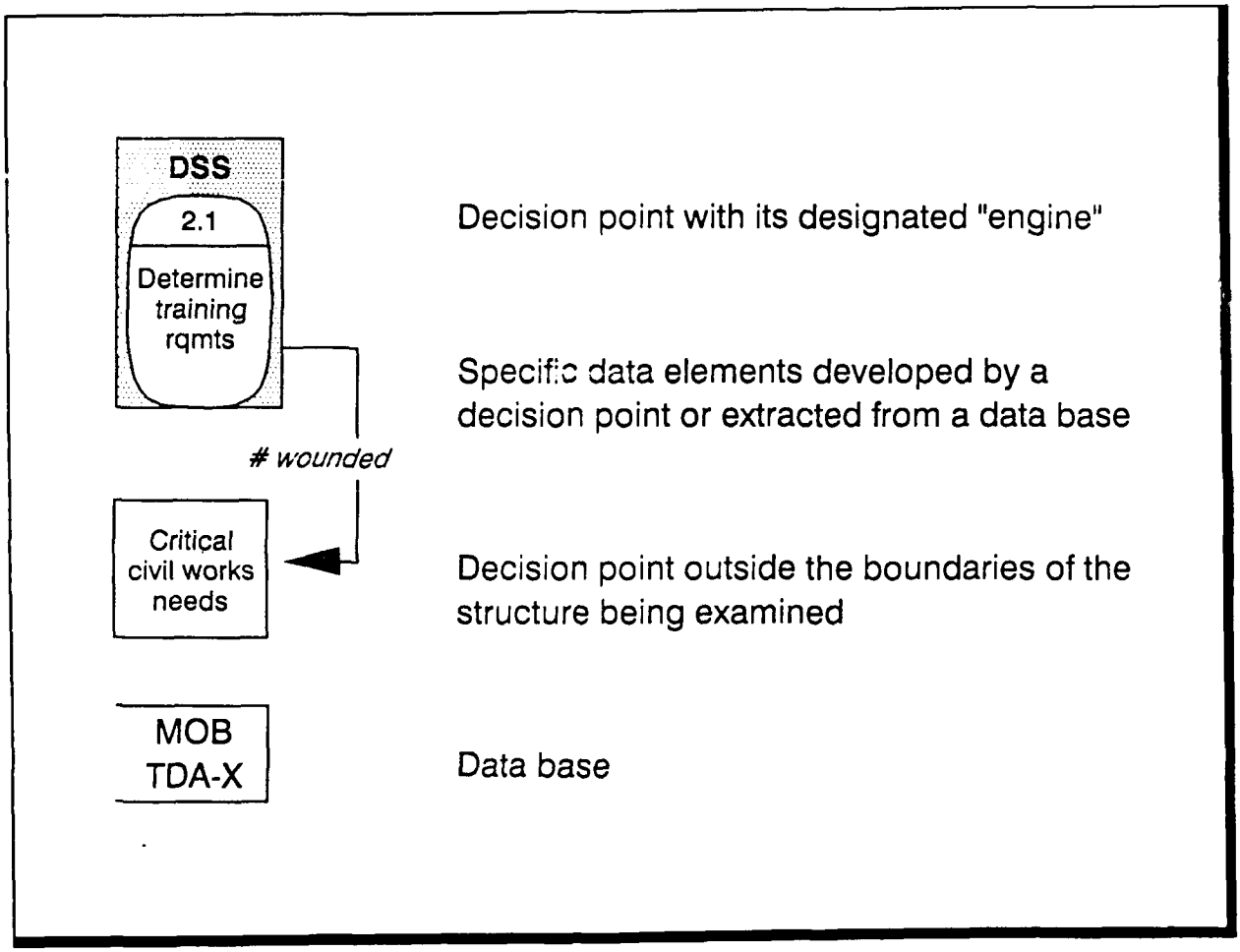


Figure A-1. The Structured Analysis Language.

SYSTEM DESCRIPTIONS

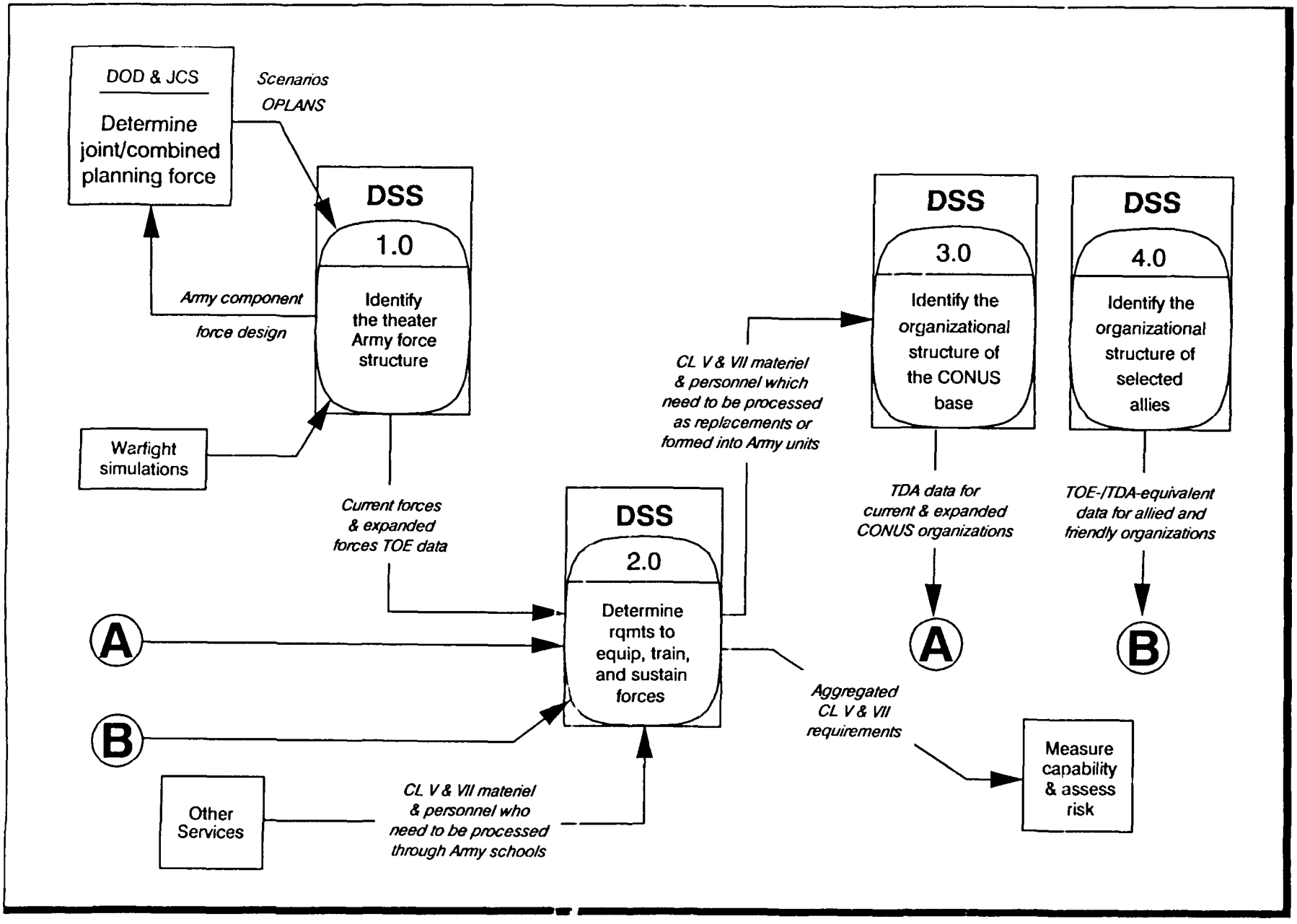


Figure A-2. Overview of the MOBNET Requirements Determination System.

4. **System Overview.** MOBNET is composed of four component decision points. Figure A-2 graphically describes the system recommended for determining mobilization materiel and munitions requirements.

a. (Decision Point 1.0) The Joint Chiefs of Staff (JCS) approve the operations plans (OPLANs) submitted by the various theater commanders (CINCs). They also develop the planning scenarios which depict reasonable sequences of political and military events leading to a decision by the United States to mobilize its armed forces and engage in combat operations. Using the data from the OPLANs and the scenarios, the Army--through its analytic arm, the Concepts Analysis Agency (CAA)--determines the force structure that is required to execute the Army portion of the OPLAN. The data produced at the conclusion of the CAA and subsequent Army staff analyses consist of specific Tables of Organization and Equipment (TOE) information for each combat, combat support, and combat service support unit in the combat theater(s). This is a total accounting of *not only the current force (active and reserve component units), but also the forces which need to be added to expand the Army's capability enough to execute the national strategy.* The force structure information is the keystone used to develop materiel and ammunition requirements for the U.S. Army.

b. (Decision Point 2.0) All materiel and munitions requirements can be accounted for through one of three activities:

(1) Materiel and ammunition are required as initial issue to all deploying U.S. Army theater forces and to all those Army organizations remaining within the territories of the continental U.S. (CONUS). There may well be requirements to equip brand new allied units or units from non-allied but friendly polities. The sister services will also generate a measurable requirement for Army-managed materiel to equip their military formations.

(2) Classroom and field training of personnel and units will generate requirements for Class V and VII materiel. Although most of the training needs will be driven by U.S. Army inductees and formations, non-U.S. training and training of Navy, Air Force, and Marine personnel will also represent a significant part of the total training load.

(3) Sustainment considers not only the sustainment needs of U.S. Army but also the needs of the other services and non-U.S. units for Army-managed items.

c. (Decision Point 3.0) The size and structure of the CONUS base is dependent on the numbers of people and the amount of materiel required to equip, train, and sustain the force. For example, as more *trainees* enter the system, more *trainers* and training equipment are needed to accomplish the training. In turn, a need for more trainers translates into a requirement to train more trainers--themselves creating an additional need for trainers. This iterative process is inferred from the two data arrows: one exiting decision point 3.0 and entering 2.0 and the other exiting 2.0 and entering 3.0.

d. (Decision Point 4.0) The final component of MOBNET involves determining the allied and friendly military support requirements. Selected allies and friends will be eligible for materiel support from the U.S. production base. Eligibility of candidate foreign military formations for U.S. support is determined by a relative assessment of their importance to the political and military goals of the United States.

e. The aggregated Army requirements are then measured against the capability of the industrial base to satisfy them. There are several models which are designed to do this comparative analysis.

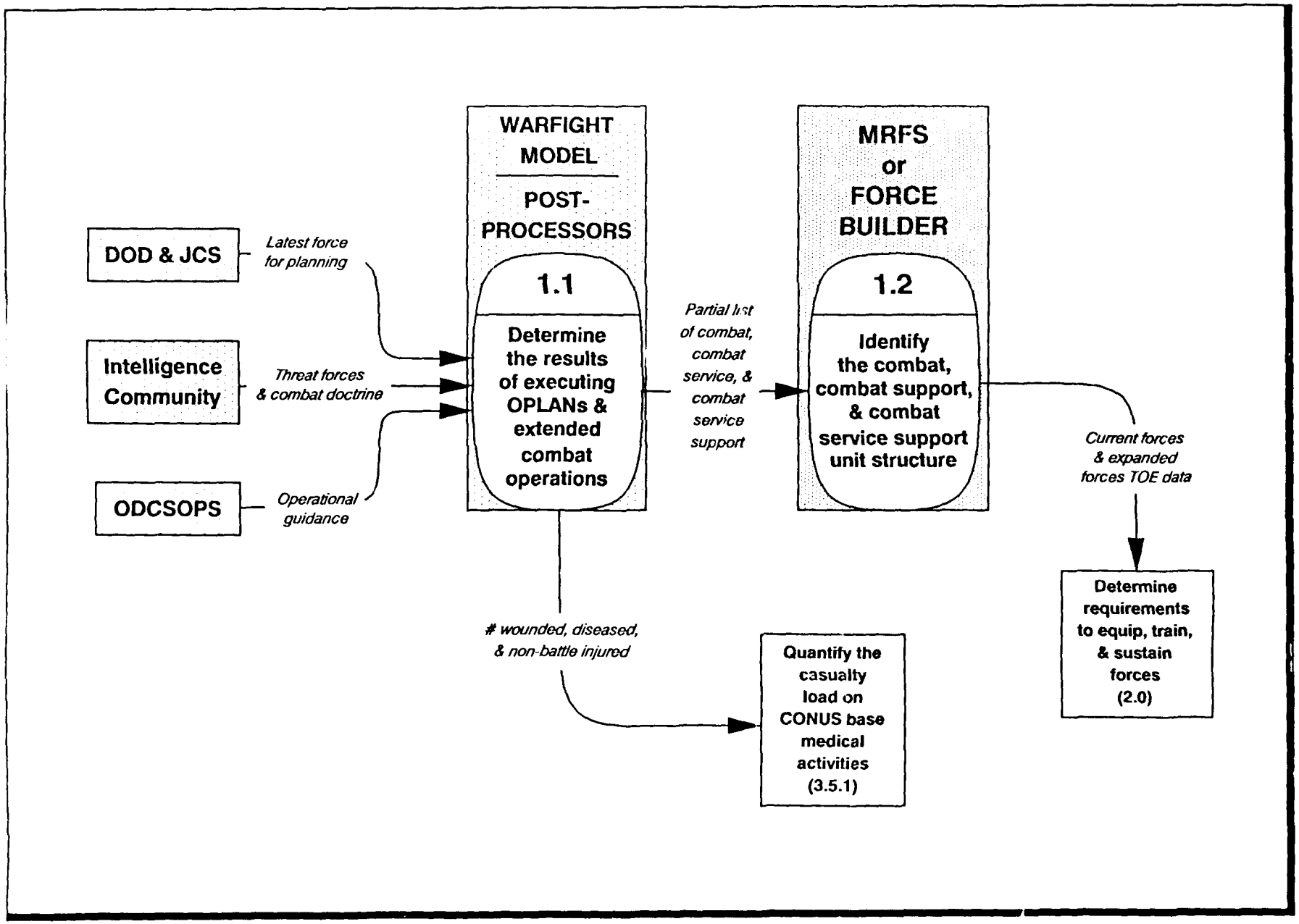
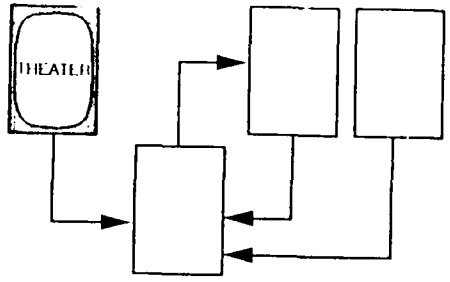


Figure A-3. Identify the Theater Army Force Structure.

5. **Identify the Theater Army Force Structure** (Decision Point 1.0). Identifying the full composition of the theater forces is of fundamental importance to the determination of requirements. The composition and size of the forces deployed to the combat theaters has a direct influence on both the composition and size of the CONUS base organization and the materiel necessary to equip, train, and sustain the total Army. The structure of the deployed forces also influences the size and structure of non-U.S. forces supporting the United States militarily. Figure A-3 shows the major components of Decision Point 1.0.



a. (Decision Point 1.1) JCS-approved, notional force structures and OPLANs are provided to CAA (through the Office of the Deputy Chief of Staff for Operations and Plans [ODCSOPS]) as planning guidance[2] Intelligence data about the threat's military formations and combat doctrine are received from the Defense Intelligence Agency. Guidance governing specific modeling excursions, play of advanced weapon systems, and deployment of expanded force units is furnished by ODCSOPS. These data are the grist for the warfight model and post-processors.[3] The warfight model generates a casualty count which is used by the CONUS-base medical commands to generate their requirements. It currently generates variable rates of advance and retreat based on friendly-threat force ratios which are used by the Mid-Range Force Study (MRFS) in order to flesh out the force structure.

b. (Decision Point 1.2) The MRFS uses the Force Design Model to develop a partial list of combat, combat support, and combat service support formations. Unit allocation rules and data from the *Army Force Planning Data and Assumptions* complement the Force Design Model to flesh out the theater force structure. In the alternative, another model--Force Builder--is also capable of designing a complete force without resort to supporting off-line analysis.[4] Whichever model is ultimately used, it must produce a complete laydown of the theater forces--and, it must provide a unit-by-unit designation of TOEs (or comparable data tables such as Modified or Living TOEs). The TOE catalog of unit materiel requirements by Line Item Numbers is a particularly important aspect of the MOBNET requirements determination system.

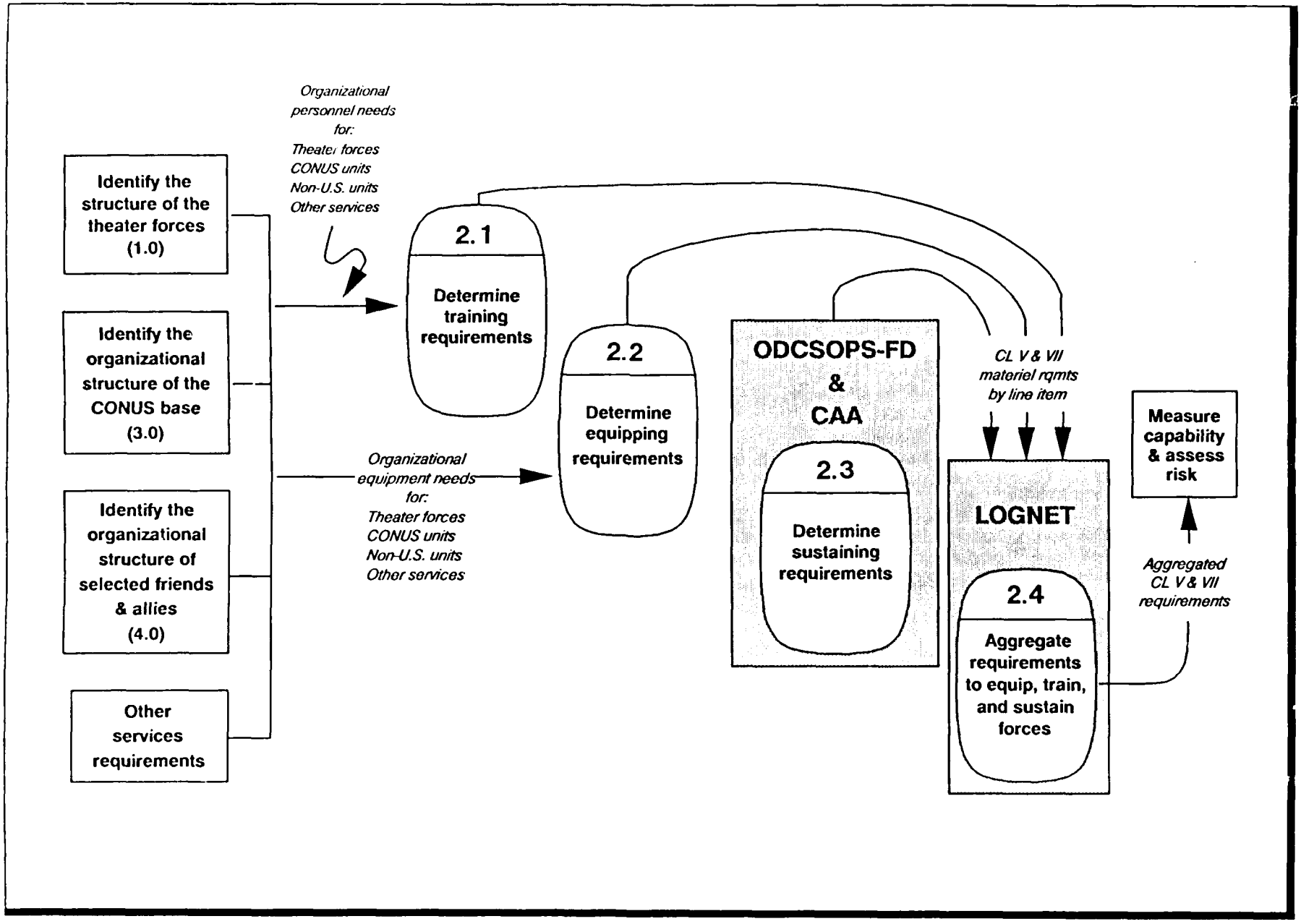
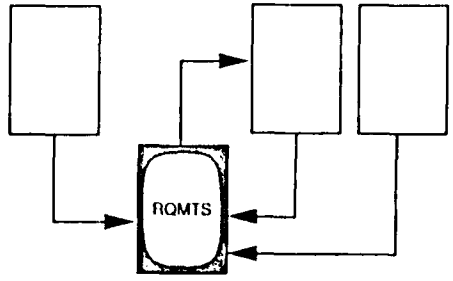


Figure A-4. Determine Requirements to Equip, Train, and Sustain.

6. **Determine Requirements to Equip, Train, and Sustain Forces** (Decision Point 2.0).

a. This sub-system (Figure A-4) determines the equipment and munitions requirements to support theater forces, CONUS-base organizations, other services, and non-U.S. formations. The other decision points--1.0, 3.0, and 4.0--develop the force structure and organizational data necessary for calculating materiel requirements for U.S. Army and allied or friendly forces which, when coupled with requirements from the other services, give the total demand for Army-managed Class V and Class VII materiel. Decision points 2.1 and 2.2 are decomposed and presented in detail in following paragraphs.



b. The Force Development staff of ODCSOPS, in conjunction with CAA, is currently reexamining the controversial issues of materiel combat loss and expenditure rates generated by the CAA combat models and used to determine materiel requirements. Until more details are available, the specific components of the sustainment sub-system (Decision Point 2.3) remain undefined. ***However, as design of the sustainment system progresses, the developers must be sensitive to the mobilization community's need for detailed item-by-item information about the additional equipment and ammunition requirements.***

c. Decision Point 2.4 represents a simple aggregation of the Class V and VII requirements developed by the other decision points in the sub-system. The Logistics Network (LOGNET) is an excellent candidate DSS for collecting data from the various component systems. Its flexibility enables LOGNET to accept and manipulate data that come in a variety of formats.

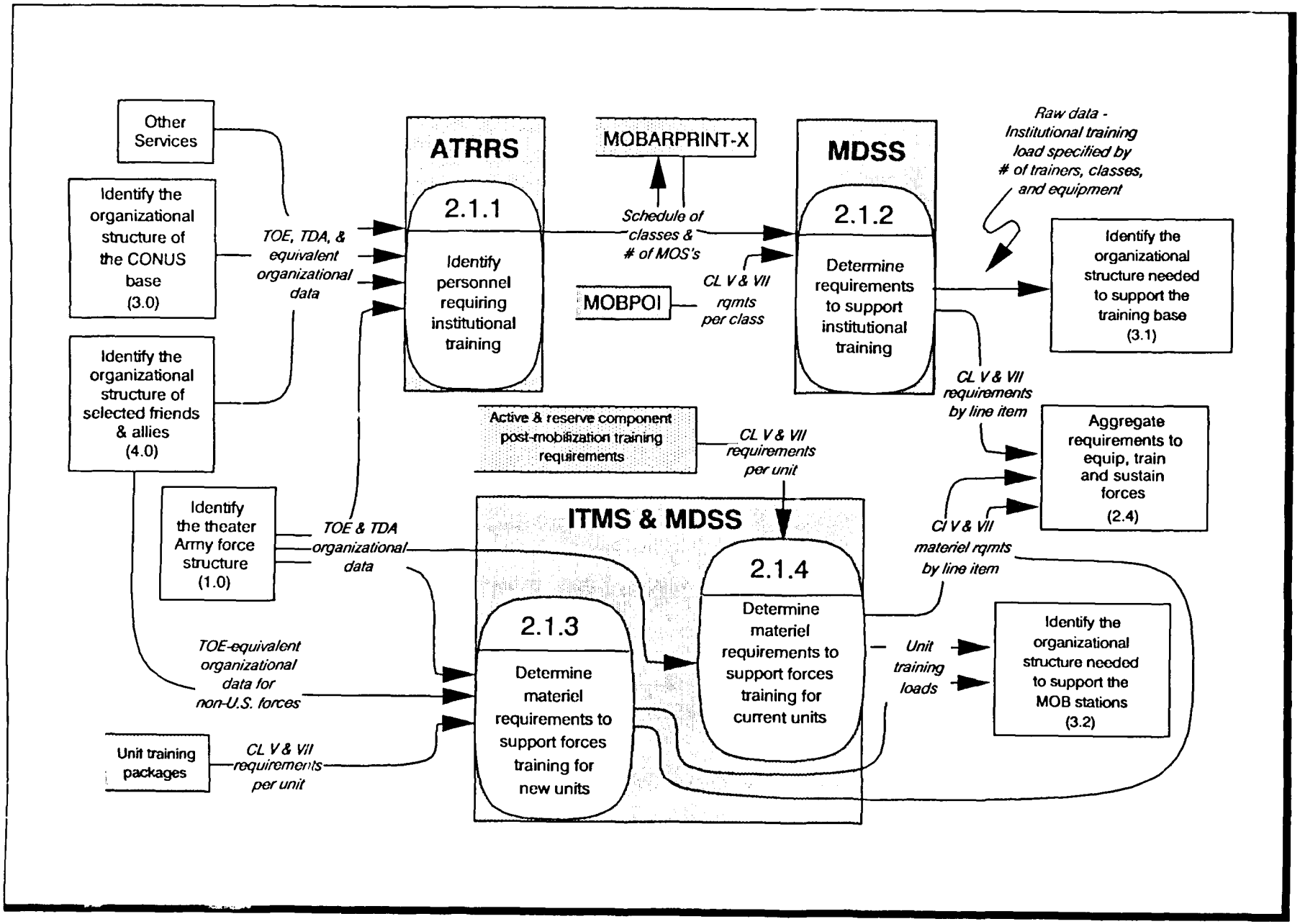


Figure A-5. Determine Training Requirements.

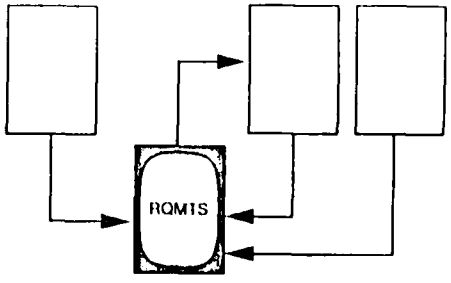
7. **Determine Training Requirements** (Decision Point 2.1). Figure A-5 presents the detailed components of Decision Point 2.1 which determine the materiel requirements to conduct both institutional training (e.g., basic and military occupational skill [MOS] training) and forces training (e.g., unit tactics and battle drills). *It is important to distinguish between the materiel requirements to support the actual training--the subject of Decision Point 2.1--and the requirements to support the organizations responsible for conducting the training or providing the training facilities--the subject of Decision Points 3.1 and 3.2 discussed later.* Decision Points 2.1.1 and 2.1.2 track the processes for measuring the requirements for institutional training, while Decision Points 2.1.3 and 2.1.4 track the processes for forces training.

a. (Decision Point 2.1.1) Using TOE, Table of Distribution and Allowances (TDA), and equivalent data from the other services and non-U.S. forces, the Army Training Requirements and Resources System (ATRRS) generates the Mobilization Army Program For Individual Training - EXpanded (MOBARPRINT-X).[5] The MOBARPRINT-X is a acronym coined by ESC to denote an ARPRINT- or MOBARPRINT-like document that incorporates *training data for the new units added to the force structure during a total mobilization*. The ATRRS needs only a detailed breakdown of the expanded force structure to generate such a document.

b. (Decision Point 2.1.2) The schedules of training classes and the numbers of students entering MOS training are extracted from the MOBARPRINT-X. The ammunition and equipment requirements for each class of instruction are documented in the Mobilization Programs of Instruction (MOBPOI). The Mobilization Decision Support System (MDSS) combines the information from these two data bases to determine the Class V and VII requirements for institutional training, which are passed to Decision Point 2.4 for aggregation. ATRRS also defines the expected training load. Specific data are passed to Decision Point 3.1 to determine the support needs of the CONUS training base: number of trainers necessary to process the flow of trainees; the number of concurrent classes (generating needs for new facilities for classrooms, messing, roads, etc.); and non-training equipment (e.g., mess equipment, generators, vehicles to transport students between class locations).

c. (Decision Point 2.1.3) Participation in forces training is required for new Army units deploying to theater and for non-U.S. forces which the United States opts to train. Lists of the specific types of units which need to be trained are taken from Decision Points 1.0 and 4.0. The number and types of units needed define the type of unit training needed. Unit training packages similar to the training modules of the Army Training and Evaluation Program (ARTEP) provide the Class V and VII requirements for each unit in training. These data are collected by the Integrated Training Management System (ITMS), the Mobilization Decision Support System (MDSS), or a combination of the two systems for each training module. The result is the total Class V and VII requirement to process all new units through their requisite training cycles. Unit-training loads are passed to Decision Point 3.2 for further processing.

d. (Decision Point 2.1.4) The ITMS and MDSS are also used to calculate the requirements to support unit training for unresourced current force units and for those current force units which lack the cohesiveness essential to deploy to a combat theater. Decision Point 1.0 provides the structure of the current force. A data base similar in content to the unit training packages provides the materiel *requirements for each module of training as well as a modified* mobilization training schedule. The result is the total Class V and VII requirement to support unit training for the current force. Unit-training loads are passed to Decision Point 3.2 for further processing.



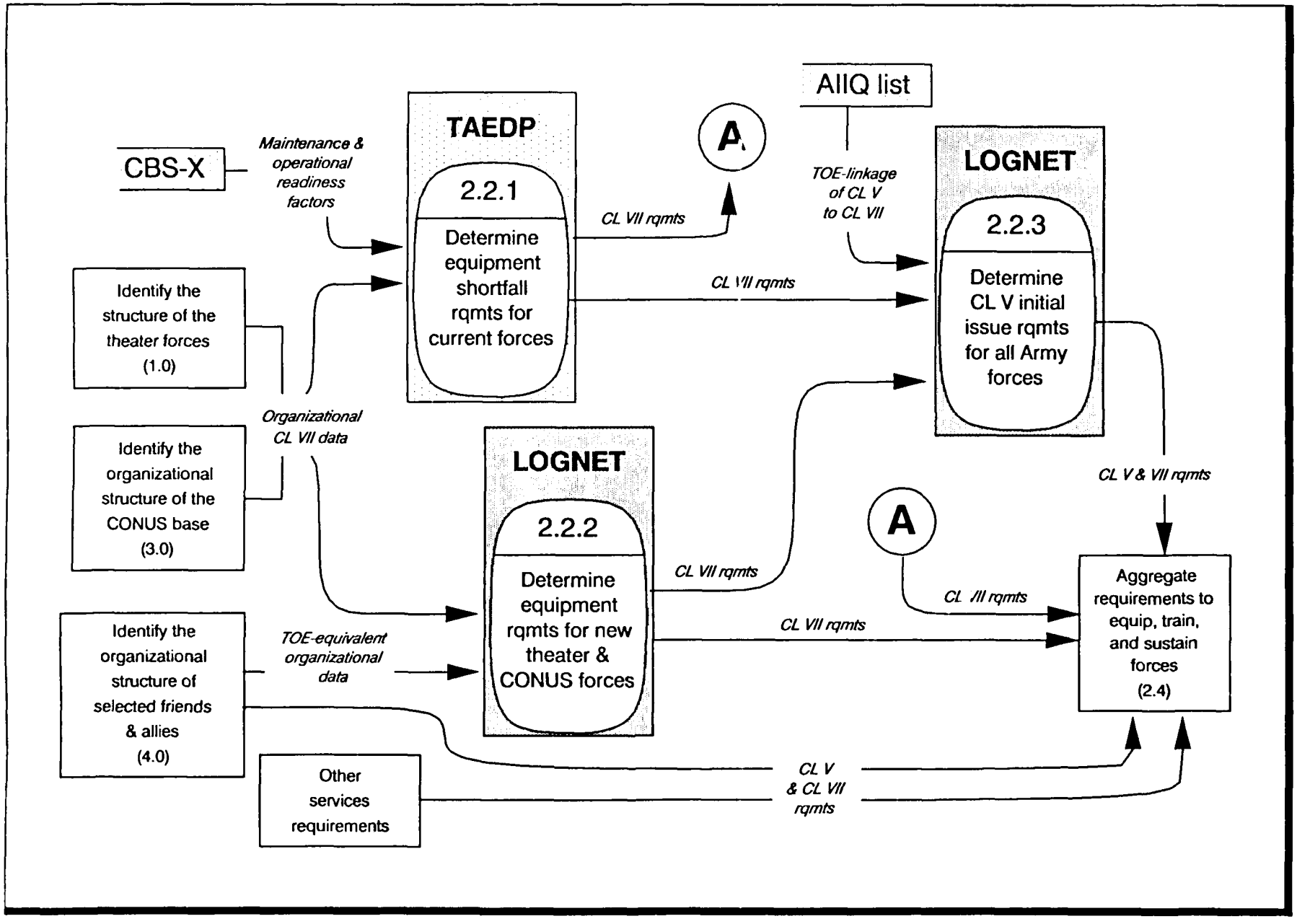


Figure A-6. Determine Equipping Requirements.

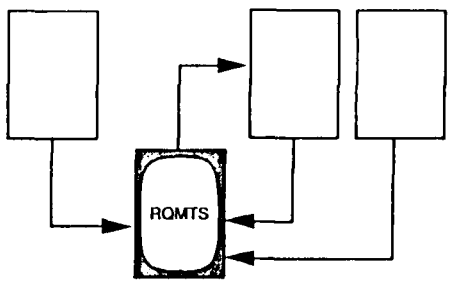
8. **Determine Equipping Requirements** (Decision Point 2.2). Figure A-6 graphically shows the decision system which results from decomposing Decision Point 2.2. Decision Points 2.2.1 and 2.2.2 measure, respectively, the equipment necessary to eliminate shortages within the current force and to built new units from scratch. Decision Point 2.2.3 estimates the munitions required as initial issues for all weapons systems added to the inventory.

a. (Decision Point 2.2.1) The Total Army Equipment Distribution Program (TAEDP) takes the line-item equipment data from the TOE/MOBTDA-X data base, combines them with maintenance and operational readiness factors from the Continued Balance System Expanded (CBS-X), and calculates the Class VII requirement for current force units which are less than fully resourced or completely unresourced (COMPO-4). The total Class VII requirement is passed to Decision Point 2.4 to be aggregated. Those Class VII items which are weapons systems or platforms and which, therefore, generate an ammunition requirement are passed to Decision Point 2.2.3 for further processing.

b. (Decision Point 2.2.2) Logistics Network (LOGNET) accesses specific line-item equipment requirements for new units built to expand theater and CONUS base formations. It also accesses line-item equipment requirements for non-U.S. units in those instances that their support requests are presented as TOE-unit-equivalent packages (e.g., provide materiel for a new German armored formation equipped with U.S. equipment). Non-U.S. support requirements conceivably come in two formats: unit packages or as requests for specific amounts of single line items (e.g., an Afghan request for 200 Stinger missiles). The second request option is reflected by the passage of Class V and VII requirements from Decision Point 4.0 directly to Decision Point 2.4 to be aggregated. LOGNET manipulates these data elements to estimate the total Class VII requirements for building new units. The total requirements are passed to Decision Point 2.4 to be aggregated. The data for those equipment items which are consumers of ammunition are passed to Decision Point 2.2.3 for further processing.

c. (Decision Point 2.2.3) The Ammunition Initial Issue Quantity (AIIQ) list provides the specific ammunition amounts authorized to be issued in support of each weapons system deployed. LOGNET combines the weapons systems' data obtained from Decision Points 2.2.1 and 2.2.2 with the AIIQ data to generate the Class V requirements to field units complete with their initial issue of ammunition.

d. Other Services Requirements. The Class V and VII requirements for the sister services are passed directly to the aggregation step, Decision Point 2.4.



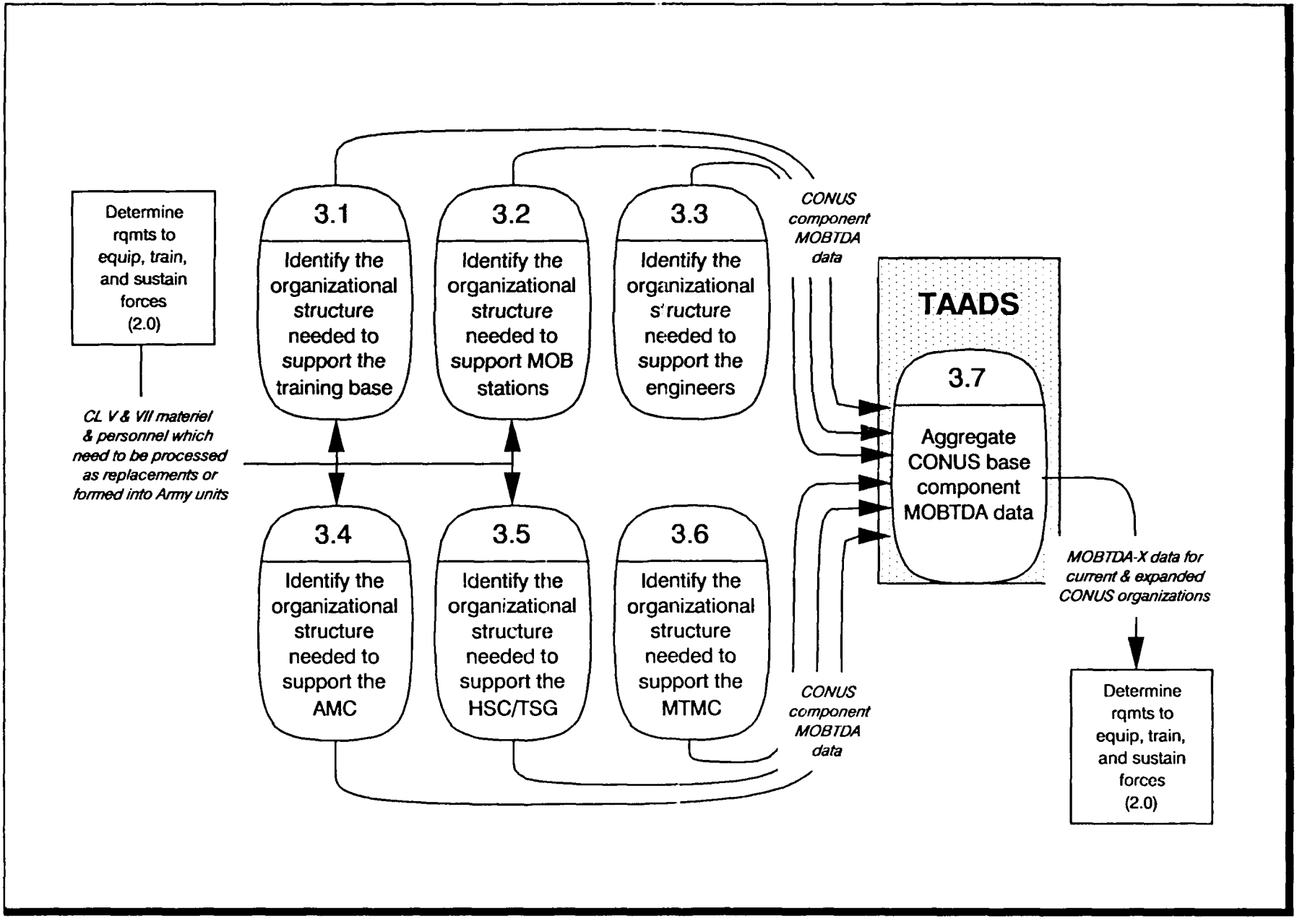


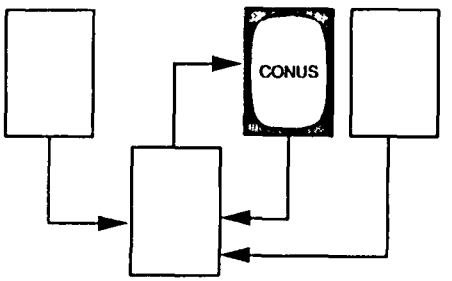
Figure A-7. Identify the Organizational Structure of the CONUS Base.

9. **Identify the Organizational Structure of the CONUS Base** (Decision Point 3.0). Decision Point 3.0 (see Figure A-7) does not measure materiel requirements directly. It develops the organizational structures needed by the Army's CONUS base to support mobilization. The specific organizational needs of the component CONUS commands are fed back to Decision Point 2.0 in the form of MOBTDA data to determine the materiel required to equip, train, and sustain the CONUS base.

a. In general, the composition of the training bases, mobilization stations, Army Materiel Command (AMC) activities, and the medical community (HSC) are dependent on the size and structure of the forces passing through the CONUS base for initial equipage and training and their post-training sustainment.

b. The engineer and transportation (MTMC) activities, on the other hand, develop their organizational needs based on the support demanded by the other four CONUS base components. For example, a new unit that falls in on a mobilization station might well create a demand for increased facility construction. The construction requirement, however, is identified not in the combat unit's TOE documents but in the mobilization station's MOBTDA documentation.

c. Logistics Network (LOGNET) is used to aggregate the materiel requirements reflected in the MOBTDAs of all six component elements of the CONUS base.



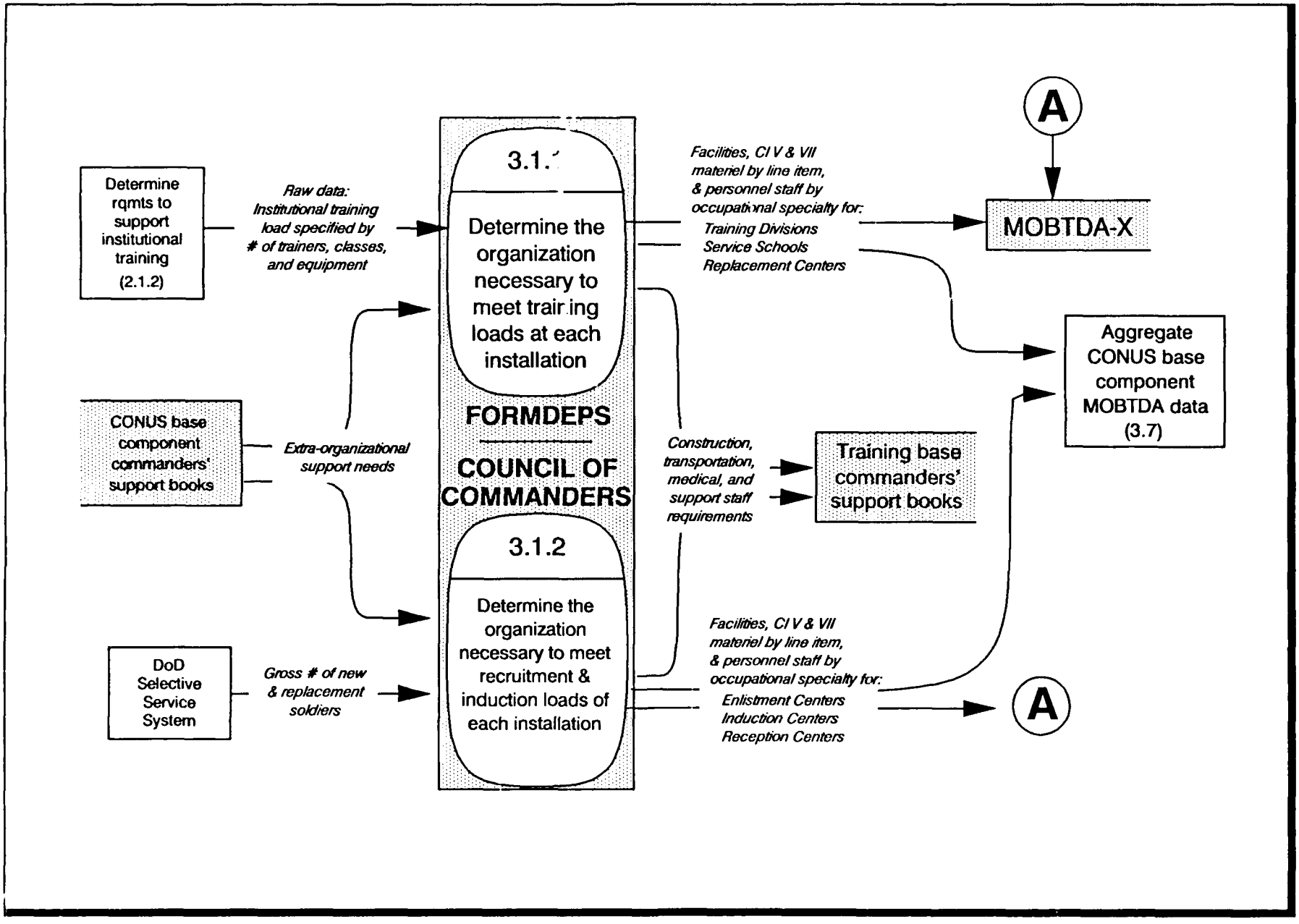


Figure A-8. Identify the Organizational Structure Needed to Support the Training Base.

10. **Identify the Organizational Structure Needed To Support the Training Base** (Decision Point 3.1). Figure A-8 shows the decomposed structure of Decision Point 3.1. The training base consists of two decision points. One defines the organizational structure necessary to provide adequate institutional training to recruits and volunteers, the other defines the structure necessary to process civilians into military service.

a. (Decision Point 3.1.1)

(1) The Mobilization Decision Support System, at Decision Point 2.1.2, generates training load data which are characterized by the number of training personnel necessary to teach the syllabi, the number of separate classes of instruction, and--from the Programs of Instructions--the amount of materiel needed to support the instructors (e.g., the number of radios needed to coordinate firing range activities).

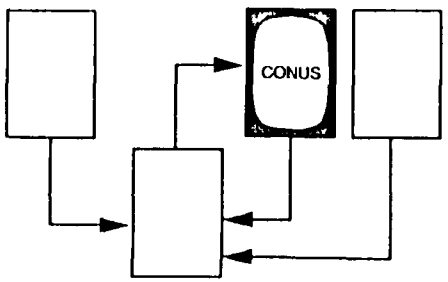
(2) The CONUS base component commanders' support books are imaginary documents which contain compilations of unit requirements. They represent the component commanders' best initial estimate of requirements for extra-organizational support and may actually be represented by staff reports, hand-written notes, or expert testimonies. ESC settled on the idea of support books to emphasize the need for intra-command coordination and to simplify the decision structure.

(3) The council of commanders is a phrase used to describe the process used by representatives of the different CONUS base component organizations to assemble their own and the installation commander's MOBTDA. Typically, the installation coordinates meetings with representatives from its own staff, each tenet activity, and supporting CONUS commands during which mobilization support is negotiated. Negotiated support might include, among others: a central mess facilities; a central health unit or hospital; a motor pool; and, most certainly, buildings for office space. Certain of these requirements are met by the installation (e.g., mess facilities, distribution of existing office space, etc.) while others are met by CONUS base component commands (e.g., health units and hospitals [HSC and MEDCOM] and new facilities [Corps of Engineers]). The interrelationships among the CONUS base component elements necessitates this close coordination.

(4) *The council of commanders and the component commanders' support books reappear as a decision point and a data base for each of the third tier CONUS base component structures. They can be viewed as the coordinating linkage between the organizations that make up the CONUS base.*

(5) Following the guidance set forth in the *U.S. Army Forces Command Mobilization and Deployment Planning System (FORMDEPS)*, the council of commanders examines the support needs of the training divisions, service schools, and replacement centers. The result is a list of ammunition, equipment, and personnel requirements which is the basis for updating unit MOBTDA-Xs.[6] If the training base commander is a tenant of another command's installation, he documents the extra-organizational support requirements in the training base commanders' support book. If the training base commander is also the installation commander, the MOBTDA-X reflects the support needs of the tenant activities--including their need for facilities.

b. (Decision Point 3.1.2) The capacity of the DoD selective service system determines the processing load through the recruitment, induction, and reception centers which, in turn, determines the organizations' staff and equipment needs. Installation support needs for tenant activities are considered where appropriate. Requirements data are used by the council of commanders, following FORMDEPS guidance, to build the MOBTDA-Xs for the enlistment, induction, and reception centers.



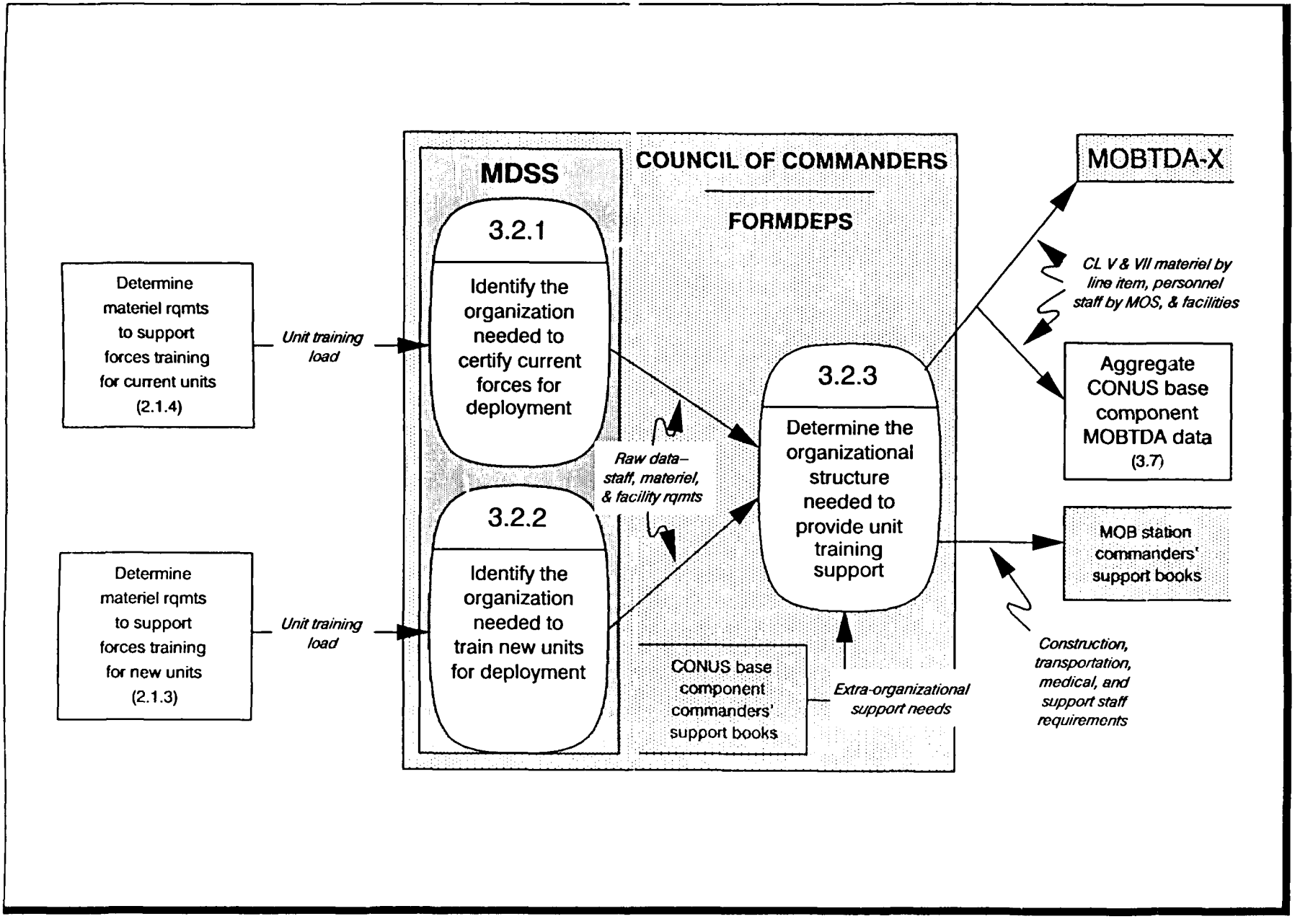
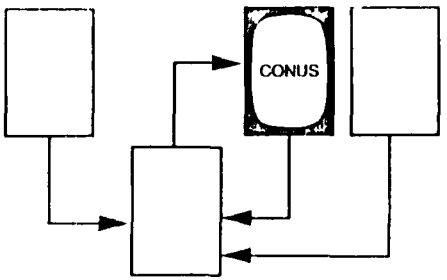


Figure A-9. Identify the Organizational Structure Needed to Support Mobilization Stations.

11. **Identify the Organizational Structure Needed To Support Mobilization Stations** (Decision Point 3.2). Figure A-9 shows the decomposed structure of Decision Point 3.2. It examines requirements generated by two categories of unit training. The first is the training needed by current force units which, for a variety of reasons, lack the full complement of training necessary to be certified combat-worthy for overseas deployment. The second category is the training needed to transform MOS-school graduates and cadre into new units capable of deploying to combat.



a. (Decision Point 3.2.1) The Mobilization Decision Support System (MDSS) converts unit training load data taken from decision point 2.1.4 into staff, materiel, and facility requirements for current force units.

b. (Decision Point 3.2.2) The MDSS also converts unit training load data taken from decision point 2.1.3 into staff, materiel, and facility requirements for new units for the expanded force.

c. (Decision Point 3.2.3) The MDSS develops requirements data which need to be further refined through the council of commanders process (see discussion of this process beginning in paragraph 10.a.(2) on page 19). This process results in a definition of the equipment, ammunition, and personnel needed to staff the mobilization station which is used to develop the MOBTDA-Xs. Under today's guidelines all mobilization station commanders are also installation commanders. Therefore, the MOBTDA-Xs will include the extra-organizational requirements to support the tenant activities. Should a future mobilization station staff find itself a tenant activity, it would develop a commander's support book delineating its extra-organizational support requirements.

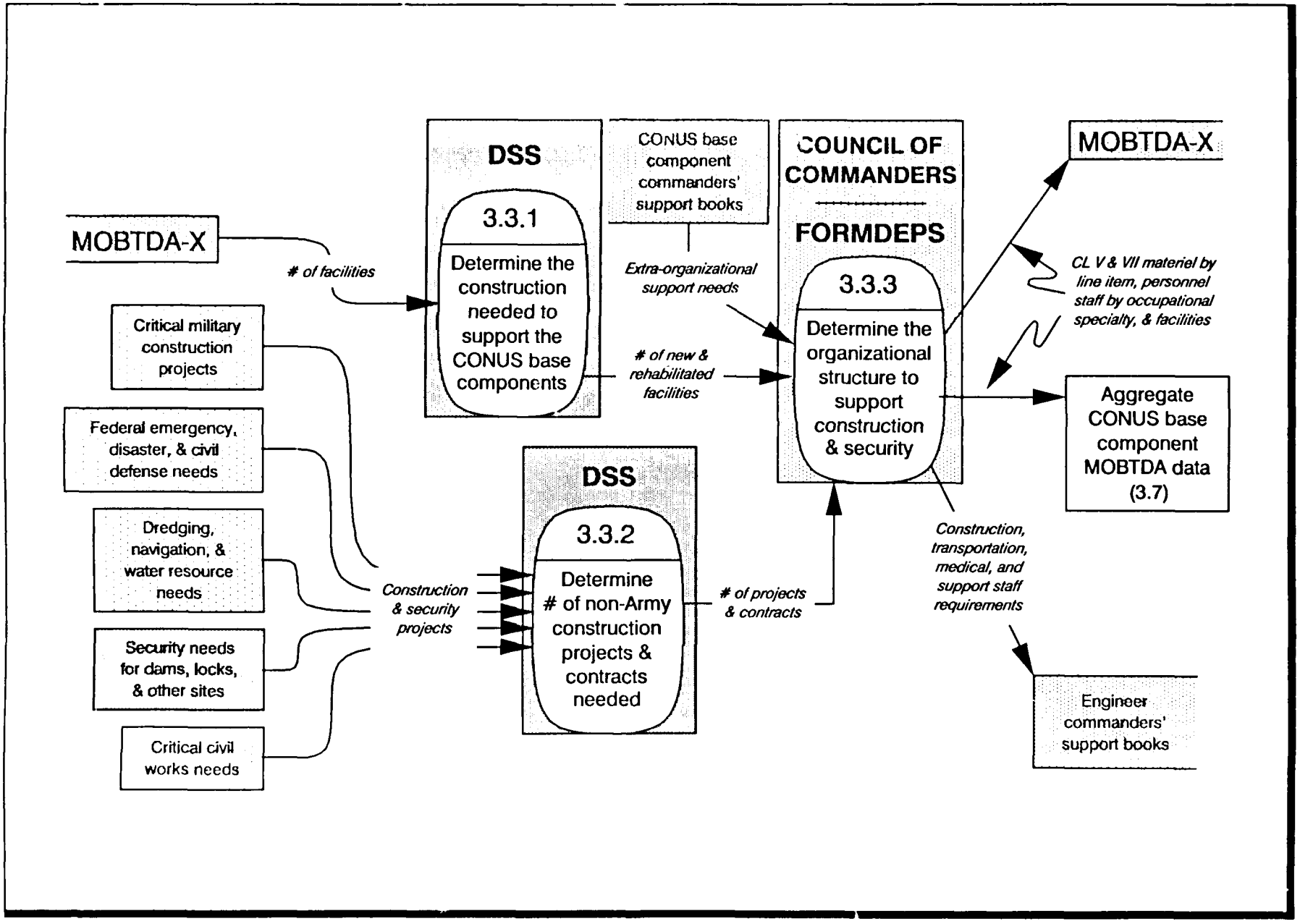
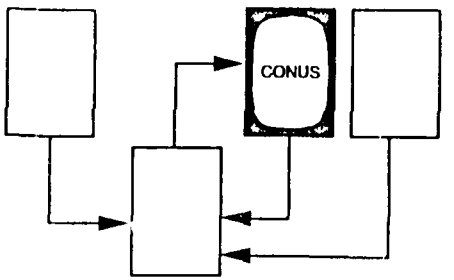


Figure A-10. Identify the Organizational Structure Needed to Support the U.S. Army Corps of Engineers.

12. **Identify the Organizational Structure Needed To Support U.S. Army Corps of Engineers** (Decision Point 3.3). Figure A-10 shows the decomposed structure of Decision Point 3.3. The Corps of Engineers is responsible not only for constructing and rehabilitating facilities to support the influx of personnel and units into the force but also for supporting the construction needs of other Federal departments and agencies. A third, relatively new mission, is to maintain security for dams, locks, and other sites managed by the Corps.



a. (Decision Point 3.3.1) The MOBTDA-Xs provide the basic requirements data for facility construction. Included in the MOBTDA-X format is an explicit breakdown of the amount and type of construction needed at each installation. The Corps of Engineers needs to develop an automated support system which can access the MOBTDA-X data line item by line item. The product of the decision support system would be a compilation of the number of facilities needed at each and all installations.

b. (Decision Point 3.3.2) The Corps of Engineers has other support requirements during mobilization. Critical military projects not included on any installation's MOBTDA-X demand resources. Engineer support for disasters and civil defense, for the nation's waterways, for critical civil works projects, and for special security needs also demand resources to manage projects and to let and monitor contracts. The Corps needs to develop a DSS which would access these data and determine the probable resource needs.

c. (Decision Point 3.3.3) Decision points 3.3.1 and 3.3.2 develop organizational staffing requirements data which need to be further refined through the council of commanders process (see discussion of this process beginning in paragraph 10.a.(2) on page 19).

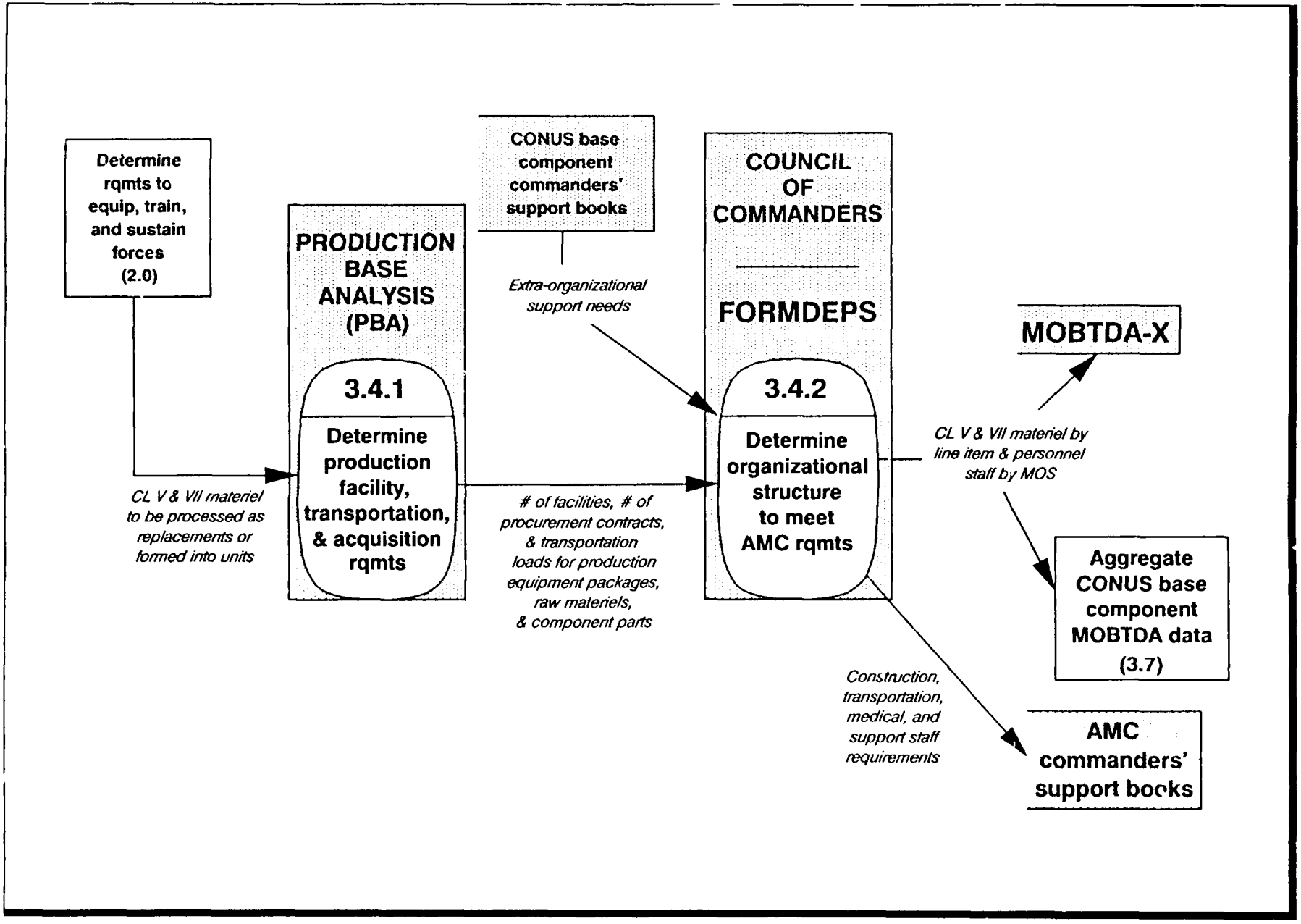
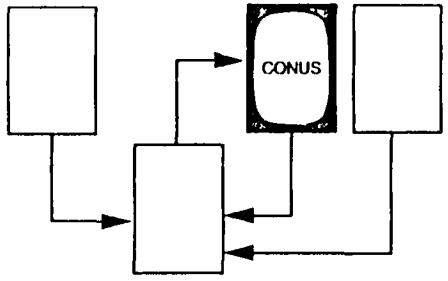


Figure A-11. Identify the Organizational Structure Needed to Support the Army Materiel Command.

13. **Identify the Organizational Structure Needed To Support the Army Materiel Command** (Decision point 3.4). Figure A-11 shows the decomposed structure of Decision Point 3.4. The Army Materiel Command manages its own production facilities in addition to managing contracts for domestic military production efforts.

a. (Decision Point 3.4.1) Decision Point 2.0 provides the aggregated equipment and ammunition requirements for the total force under consideration. From these, the Production Base Analysis determines the number of facilities and procurement contracts and the transportation support to move production equipment packages, raw materials, and component parts to appropriate production facilities.

b. (Decision Point 3.4.2) These organizational staffing requirements data are further refined through the council of commanders process (see discussion of this process beginning in paragraph 10.a.(2) on page 19).



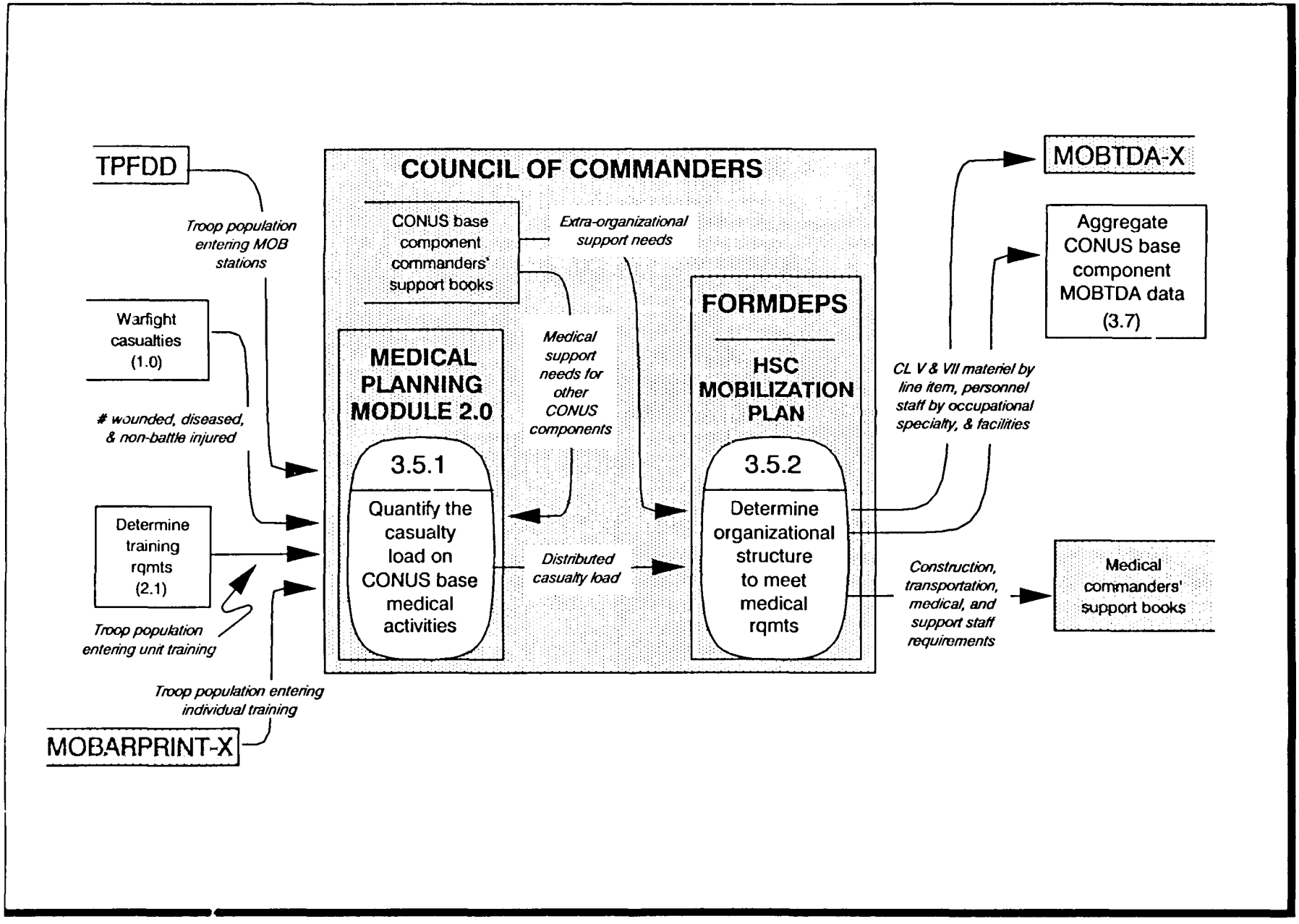
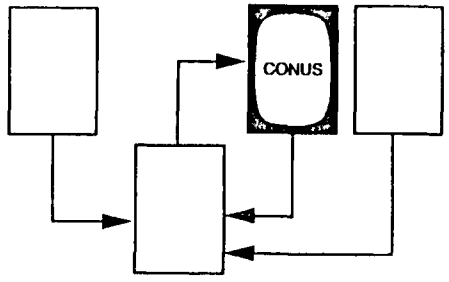


Figure A-12. Identify the Organizational Structure Needed to Support the Medical Components.

14. **Identify the Organizational Structure Needed To Support the Medical Components** (Decision Point 3.5). The medical components consist of elements of the Health Services Command and The Surgeon General. Figure A-12 shows the decomposed structure of Decision Point 3.5.



a. (Decision Point 3.5.1) The Medical Planning Model 2.0 calculates the casualty load distributed over the course of the warfight scenario. The model extracts the troop population at mobilization stations from the Time-Phased Force Deployment Data (TPFDD). These data provide a basis for estimating training casualties expected within the current force. The warfight models (Decision Point 1.0) establishes the number of combat casualties, while Decision Point 2.1 and, specifically, the MOBARPRINT-X provide the expanded-force troop populations for unit and individual training, respectively. Also included in the calculations are the medical support needs of the other CONUS elements obtained during the council of commanders.

b. (Decision Point 3.5.2) Using FORMDEPS guidance and the Health Services Command Mobilization Plan, the council of commanders refines the distributed casualty load data and the support needs of tenant activities, when appropriate. The resulting organizational staffing data are fed into the CONUS aggregation of MOBTDA data, the MOBTDA-X, and the commanders' support books (see discussion of this process beginning in paragraph 10.a.(2) on page 19).

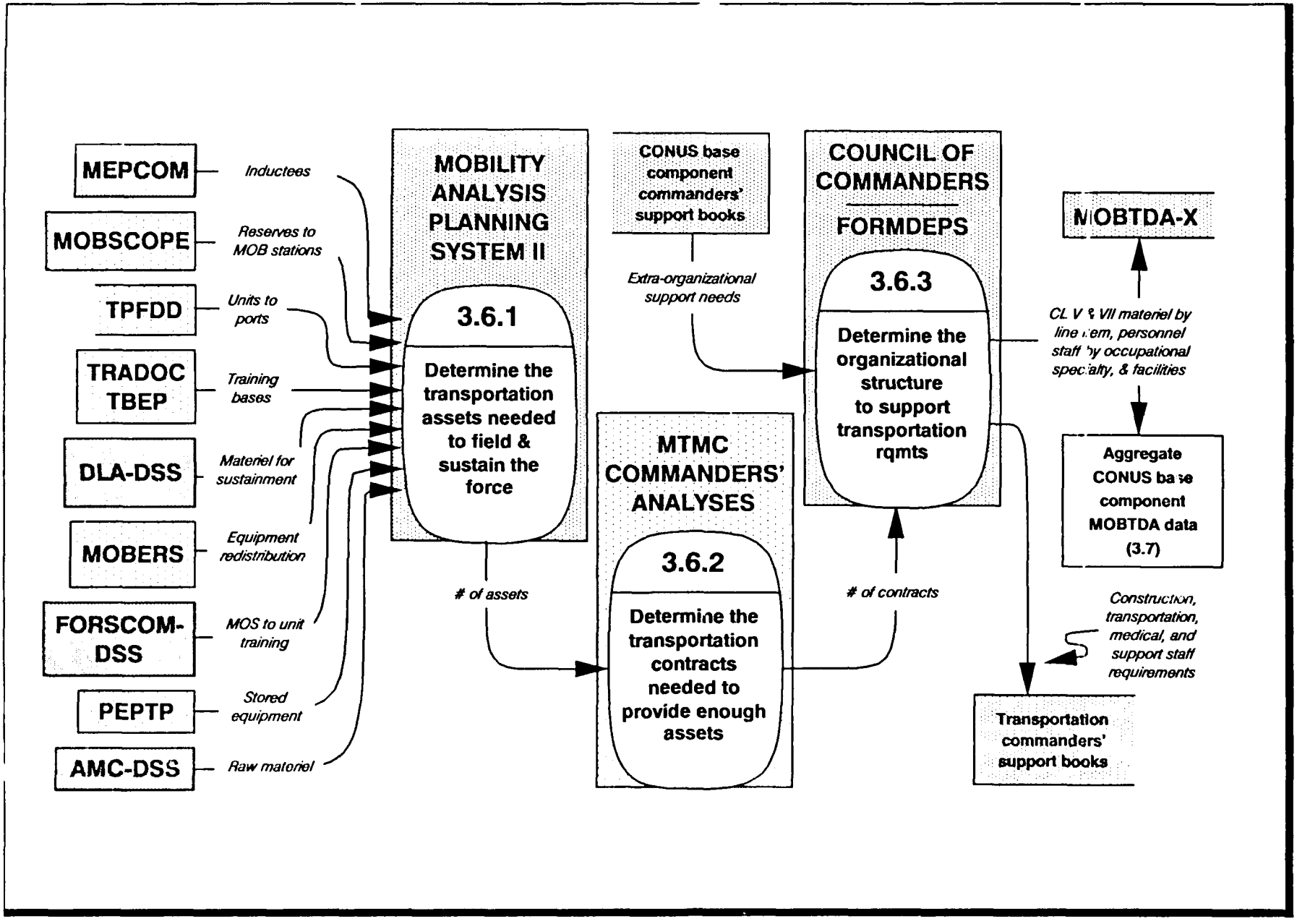


Figure A-13. Identify the Organizational Structure Needed to Support the Transportation Components.

15. **Identify the Organizational Structure Needed To Support the Transportation Components** (Decision Point 3.6). The Military Traffic Management Command provides commercial line haul, rail, and airlift assets to support the mobilization requirements of the three military services within the continental United States. Figure A-13 shows the decomposed structure of Decision Point 3.6.

a. (Decision Point 3.6.1) To estimate transportation requirements, the Mobility Analysis Planning System II (MAPS-II) accepts transportation requirements data from nine sources:

(1) The Military Entrance Processing Command provides data on the movement of inductees.

(2) Movement requirements of reserve units to the mobilization stations are documented in the Mobilization Shipments Configured For Operational Planning and Execution (MOBSCOPE).

(3) The requirements to move troop units to ports for strategic overseas deployment are obtained from the Time-Phased Force Deployment Data (TPFDD).

(4) TRADOC's Training Base Expansion Plan (TBEP) provides the movement requirements to support the training bases.

(5) The Defense Logistics Agency provides the transportation requirements to support the movement of materiel to sustain forces in both the theater of conflict and the continental United States.[7]

(6) The Mobilization Equipment Redistribution System (MOBERS) managed by the Office of the Deputy Chief of Staff for Logistics provides movement data for redistributing TOE equipment in order to improve unit readiness prior to deployment.

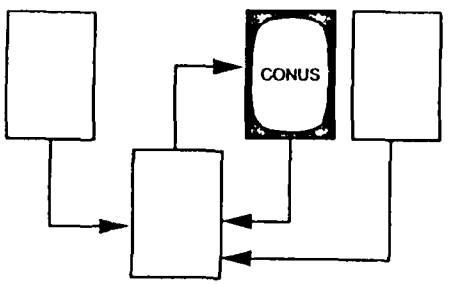
(7) FORSCOM provides data for the movement of soldiers from MOS training installations to mobilization stations for unit training or to replacement centers for further deployment to theater.

(8) AMC's Production Equipment Package Transportation Plan (PEPTP) provides the transportation requirements to move production machinery from storage sites to production lines.

(9) AMC provides the transportation requirements data for moving materials from the ore processing stage, through the several production tiers, to the final assembly stage.[8]

b. (Decision Point 3.6.2) Given the gross number of transportation assets requirements generated by Decision Point 3.6.1, the MTMC commanders must determine the number and types of service contracts to be let to commercial carriers. The number of contracts that need to be managed is a measure of the staffing requirements.

c. (Decision Point 3.6.3) These organizational staffing requirements data are further refined through the council of commanders process (see discussion of this process beginning in paragraph 10.a.(2) on page 19).



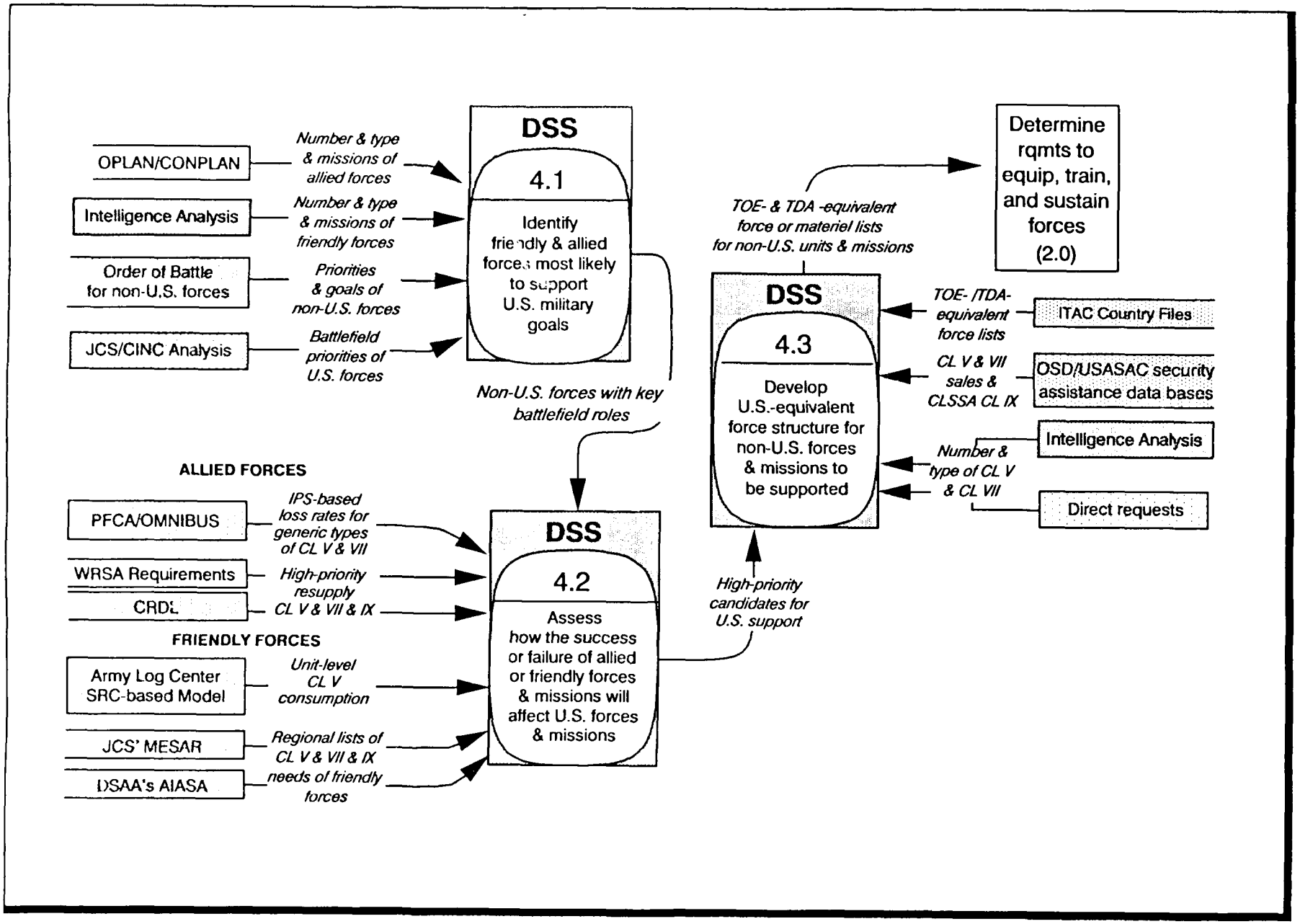


Figure A-14 Identify the Organizational Structure Needed To Support Selected Friends and Allies.

16. **Identify the Organizational Structure of Selected Friends and Allies** (Decision Point 4.0). Certain allied nations and friendly foreign politie will be critically important to the strategic goals of the United States. A decision to support such groups with U.S.-produced materiel may significantly drain the nation's production capability. Complete planning for mobilization requirements demands that planners give credence to the possibility that non-U.S. forces will pursue U.S. materiel assistance. Figure A-14 shows the decomposed structure of Decision Point 4.0

a. (Decision Point 4.1) The first step in determining the potential non-U.S. demand for materiel is to identify those forces which are likely to support U.S. political and military goals. An examination of the Operations and Concepts Plans (OPLAN/CONPLAN) prepared by the Joint Chiefs of Staff and the CINCs will reveal the number and types of friendly non-U.S. units considered to be significantly materiel to their strategic mission. However, the OPLAN/CONPLANs only provide detailed information on the forces of allied nations with which we have agreements for combined operations. Further intelligence analyses provide similar information for forces whose successes in combat are material to the global interests of the United States, but with which we have no treaty obligations. The order of battle for non-U.S. forces gives indication of non-U.S. battlefield priorities and goals, while the JCS and CINCs give the U.S. battlefield priorities. From this data, the decision makers determine those non-U.S. forces which have roles which are key to U.S. goals.

b. (Decision Point 4.2)

(1) The second step is to categorize the impact of allied or friendly forces and missions on U.S. forces and their missions. Those forces whose failure would be most deleterious to U.S. objectives are nominated as candidates for U.S. materiel support. The potential allied combat losses and their effect on the missions of U.S. forces are available from several institutionalized sources within the Army.

(2) For the NATO nations, the combat studies (the Program Force Capability Assessment [PFCA] and OMNIBUS) provide the combat-induced loss and expenditure for equipment and ammunition. For the Republic of Korea, the War Reserve Stocks Allies and the Critical Requirements Deficiency List define the high-priority resupply needs.

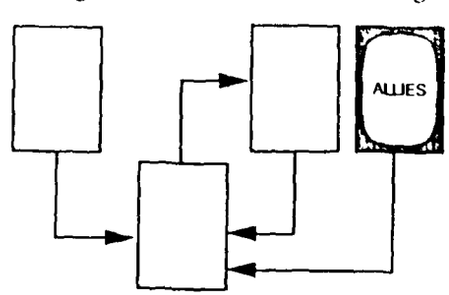
(3) Those forces friendly to the U.S. which are not included in the Army's combat models require other methods. The Army Logistics Center can estimate ammunition consumption rates for units using a PC-based model. Both the JCS's *Minimum Essential Security Assistance Requirement* (MESAR) and the Defense Security Assistance Agency's *Annual Integrated Assessment of Security Assistance* (AIASA) provide lists of potential equipment and ammunition requirements. Either or both of these data bases can be used.

c. (Decision Point 4.3) The final step is to develop either equivalent force lists for foreign armies or materiel lists which reflect the countries' explicit demands for materiel.

(1) The Intelligence and Threat Analysis Center (ITAC) provides the basic foreign force lists. These lists are valuable planning tools for those foreign forces whose organizational structure closely mirrors the forces of the United States. The support needs of these forces would be virtually identical to the needs of similar U.S. forces.

(2) Historical foreign sales data are reported by the Office of the Secretary of Defense (OSD) or the U.S. Army Security Assistance Center (USASAC). These data are a useful insight into what U.S. equipment exists in foreign armies and, therefore, what the potential demand for support might be.

(3) There are many foreign armies which are equipped with a few items of U.S. equipment but which have organizational structures very dissimilar to those of U.S. forces. In these instances, TOE- or TDA-equivalent structures are not helpful. Analyses by the intelligence community can provide relevant data as can an analysis of past requests for assistance (e.g, the British during the South Atlantic conflict with Argentina and the Israelis during the 1973 Arab conflict).



17. **Summary.**

a. The MOBNET system is an extremely complex web of integrated DSSs and data bases. Many components have yet to be developed or must undergo substantial modification before they can be assimilated. A considerable investment of time and resources is necessary to bring this network to fruition. The payoff, however, is a system that will prepare a credible estimate of the materiel requirements to support mobilization. Certainly all would agree that this is a goal worth striving for.

b. A considerable effort has been invested by the ESC analysts and untold dozens of staff representatives throughout the military community to fashion a workable approach to determining requirements. Above all else, however, the framework presented here should be viewed as a living system and ESC's work as only the first steps down the road to maturity. When DSSs or data sources evolve which are superior to those identified in the several figures of this annex, they should be examined for their worthiness as replacements.

1. Mr. Douglas T. Ross, "Structured Analysis (SA): A Language for Communicating Ideas," *IEEE Transactions on Software Engineering*, January 1977.

2. The report speaks exclusively of the JCS Planning Force as defining the military population used to generate materiel requirements for mobilization. This definition conforms to the guidance given in *Defense Guidance* and *Army Mobilization Planning System (AMOPS)*, the mobilization planning policy guidelines for the Department of Defense and Department of the Army, respectively. However, the reader should be aware that the selection of the Planning Force is purely arbitrary--any sized forced can be designated for input into this planning system.

3. Currently, the Concepts Evaluation Model (CEM) is the model of choice. However, the Force Evaluation Model (FORCEM) is designated to replace CEM. The particular model used is immaterial, however, it must be able to pit a designated U.S. force against a designated threat and generate casualties, equipment losses, and expenditures. Ultimately, it must report the TOE components of a complete force structure.

4. *Functional Description for the Force Builder Decision Support System*, prepared for the U.S. Army Force Development Support Agency under contract No. MDA903-88-C-0129 by Vector Research, Inc., 31 October 1988.

5. Tables of Organization and Equipment (TOE) provide a breakdown by line item, MOS, and grade of each unit type in the Army. Variations of the TOE include the Modified TOE (MTOE), the Draft TOE (DTOE), and the Living TOE (LTOE). The Tables of Distribution and Allowances (TDA) and their variant, mobilization TDAs (MOBTDA), display equipment and staff needs in a manner similar to the TOEs. The primary distinction between the two is that, in general, TOE units are designed to deploy to theaters of operations while TDA organizations are designed to remain in the continental United States.

6. MOB TDA-X is a notional acronym which ESC uses to differentiate between the requirements of the current force during a mobilization (documented in MOB TDAs) and those requirements which are generated not only by units of the current force but also those new units which will be added to the force structure during a total mobilization.

7. The figure shows this as a generic "DSS" or decision support system. This implies that, at the time of publication, no such system exists at the Defense Logistics Agency. Currently MTMC, the managing agency for MAPS-II, estimates these transportation requirements in order to run the model. This same situation exists with regard to the system labelled FORSCOM-DSS which is discussed in paragraph (7) below.

8. Little information has been developed concerning this requirement for transportation support. There is sufficient anecdotal evidence to strongly suggest that this requirement may be very substantial.

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ANNEX B

STUDY REVIEW COMMENTS

1. **PURPOSE.** At the completion of this study, ESC published a draft report for the review and comment of the study sponsor, the Study Advisory Group, and a select list of agencies interested in the topic. This annex presents the results of the review process.

2. **SCOPE.** Only the significant and substantive comments made during the review process are represented in this annex. Editorial comments were automatically incorporated into the final report and, therefore, are not listed in this annex. All comments are arranged by review agency, and are followed by a description of the action ESC took as a result of the comment.

Ref Pg/para

OFFICE OF THE DEPUTY CHIEF OF STAFF FOR OPERATIONS AND PLANS
Studies and Analysis Division

General

COMMENT: Overall, the draft report indicates a comprehensive systems approach to determining mobilization requirements for Supply Classes V and VII. The methodology generally relies upon existing systems, which would be linked to derive required quantities of munitions and materiel. Implicit in this methodology is the assumption that these existing systems contain data valid for this purpose. So long as the assumption holds, the methodology would seem to provide reasonable results. It would be helpful, however, to see an assessment of the quality of the data in various data bases (e.g., TAEDP, CBS-X, Allied and Friendly Forces TOEs, etc.), relative to this methodology.

RESPONSE: We agreed that there is a need to assess the quality of data used for MOBNET.

Common Systems Division

General

p. 5, ¶ 7b.

COMMENT: This is, overall, an excellent report. ESC has done a particularly good job with the MOBNET at Annex A...The definition for Full Mobilization should mention the specific type force under consideration (current force or program force).

RESPONSE: The definition is taken directly from Volume I of the *Army Mobilization and Operations Planning System*. To avoid confusion, however, the phrase "Current Force" has been parenthetically added.

P. 6, ¶ 7C.

COMMENT: The definition for Total Mobilization should also mention the specific type of force under consideration (for example, planning force).

RESPONSE: Current planning guidance sets up the JCS Planning Force as the *mark on the wall* for mobilization planning. We believe, however, that the Planning Force is a force structure goal only for planning. A defined force structure is essential to pursuing effective mobilization plans--it allows planners to exercise models, decision support systems, and policies. However, the Planning Force ***is not*** the ultimate goal of a total mobilization of the United States Army. Plans for total mobilization can be developed and validated using the notional planning force as data. However, they should be flexible enough to account for any sized force.

p. 10, ¶ 16a.

COMMENT: It would also be nice to know before the war that a deficiency exists. The United States could then act to reduce the deficiency or its impact.

RESPONSE: Agreed.

p. 13, ¶ 19c.

COMMENT: The Department of the Army Critical Items List logs only about 500 items. The Industrial Preparedness Planning List expands the list of critical items to about 2,000.

RESPONSE: The text has been changed appropriately.

p. 14, ¶ 20c.

COMMENT: The Schwarzkopf message of April 1988 is a message only and does not necessarily represent an official Army position of the subject of consumption rates. (The Concepts Analysis Agency also commented on the use of this quote--the concerns expressed in the message have been overtaken by events and no longer represent the official Army position.)

RESPONSE: The sentence has been changed so the message exerpt no longer is represented as an official Army position.

p. A-2, ¶ 3.

COMMENT: The Army needs a central manager to implement and maintain MOBNET. Perhaps a field office reporting to the Mobilization Division?

RESPONSE: We agree that a central manager must be designated if the Army is to have any chance of getting MOBNET up and running. We also believe that the Mobilization Division is the most reasonable candidate for the job.

Fig A-3

COMMENT: The data arrow from the DOD and JCS decision point is labelled *latest planning force*. The system should examine the Current, Budget, Program, Objective Forces before examining the Planning Force.

RESPONSE: The phrase *planning force* in this instance was meant to convey the idea of a notional force of any size and composition. Even with the lower case "p", however, the term generates confusion. The label has been changed.

Fig A-4

COMMENT: Regarding decision point 2.4, *Aggregate requirements to equip, train, and sustain forces*, the model LOGNET (operated by the ODCSLOG) might be a good mechanizism for aggregating requirements.

RESPONSE: Agree. LOGNET DSS is added to the figure.

p. A-15, ¶ 8

COMMENT: The Army is reexamining the definition and role of the "Army Initial Issue Quantity." It is not now, nor will it be, synonymous with basic load.

RESPONSE: We have removed the references to basic load.

Force Readiness Division

General

COMMENT: The ESC Monograph was reviewed and appears to be a generally well written document that adequately covers the topic.

p. xii

COMMENT: The Executive Summary lacks sufficient detail. The recommendations sit "naked" on the page. Since this may be the only portion of the report read by Army decision makers, it should be more complete. As a minimum, a summary of the Conclusion Chapter should be included along with some indication of how those conclusions were reached.

RESPONSE: The executive summary has been expanded as suggested.

p. A-1, ¶ 16b

COMMENT: Both PFCA and OMNIBUS are studies. They are not models as stated in this sub paragraph. PFCA does not currently produce rates. OMNIBUS produces rates for all three theaters.

RESPONSE: The paragraph has been changed.

Figures

COMMENT: On second and third tier displays, a small window showing the path from the first tier to the tier displayed would add greatly to the understanding of the system.

RESPONSE: A similar observation was made during the briefing of study results to the Study Advisory Group. We have added a small schematic to the narrative which accompanies each figure to help keep the reader oriented.

THE SURGEON GENERAL

No comment.

CONCEPTS ANALYSIS AGENCY

p.14, ¶ 20c.

COMMENT: The concerns expressed in LTG Schwarzkopf's message have been overtaken by events and no longer represent the official Army position.

RESPONSE: See similar comment from the Assistant Deputy Chief of Staff For Operations and Plans, Force Development and Integration, Common Systems Division.

OFFICE OF THE DEPUTY CHIEF OF STAFF FOR LOGISTICS
Operations and Plans Division

General

COMMENT: The conclusions reached by the ESC study concerning Army's ability to effectively mobilize--particularly for a protracted war requiring total mobilization--are sound. As pointed out in the study, the capability to mobilize for a major conventional war is more significant today than in past decades in light of current and potential future trends in nuclear arms reductions by the super powers.

General

COMMENT: ESC is on target with its recommendation that Army "needs to get serious about mobilization planning." Toward this end, the creation of an enhanced mobilization planning system is essential. MOBNET, as envisioned by the ESC study, would provide Army with a planning system that will enable planners to determine mobilization requirements. The value of such a system cannot be overemphasized, particularly if mobilization beyond the current force is one day required. ESC's recommendation for the establishment of a system like MOBNET deserves serious consideration by the Army's top leadership.

p.5, ¶ 7b.

COMMENT: A main point of this paragraph is that it would be unlikely that the United States would remain at full mobilization without having to transition to total mobilization in short order after the decision to fully mobilize. Whether this is likely or unlikely cannot easily be determined and the ESC position may be overstated. In addition to its primary purpose of placing the nation on a wartime footing, full mobilization is also a potentially effective political tool that could be used to demonstrate resolve in a crisis situation. The implementation of full mobilization has a specific deterrent value. Hostilities may or may not occur even in a scenario that brought the nation to full mobilization. Total mobilization may not be implemented until the beginning of hostilities. It is possible that a considerable amount of time could pass between the implementation of full mobilization and the transition to total mobilization.

RESPONSE: The Army must be sensitive to the implications of a full mobilization. If ESC has overstated its position, it has only done so only for emphasis--and only slightly. The JCS Planning Force is, by definition, the minimum force that must be available *by D-day* to execute the nation's strategy. The design of the Planning Force, moreover, is the result of compromises which impose a *degree of risk* on the execution of the strategy. The *current* or *approved* force is the culmination of efforts to field the JCS Planning Force--limited by financial, political, and economic constraints. If the Army deploys only the current force on D-day, the nation's ability to execute its strategy will be at **great** risk. Long lead times are required to expand current forces and the industrial base. Therefore, it is imperative that the United States begin efforts early to size its forces and industrial base in readiness for war. If the relationship between the super powers has deteriorated to the point where the current force is mobilized (and keep in mind the current force requires the creation of COMPO 4 units before it is complete), then the nation had better begin preparations necessary for total mobilization.

NATIONAL DEFENSE UNIVERSITY

General

COMMENT: Recommend that army planning be tied into the Graduated Mobilization Response (GMR) concept being developed by OSD, JCS, and the civil agencies. On page 11 discussion of executing mobilization responsibilities incrementally should be tied to GMR. This plan is part of Army's Phase I: Preparation and equates to the lowest level of GMR. Army Phase II includes alert and equates to GMR Level II. Army Phase III-V equates to highest level of GMR. This comment should be made in the report because it is essential in industrial base production planning.

RESPONSE: The Deputy Chief of Staff for Operations and Plans tasked the Engineer Studies Center to rewrite the Army's policy for total mobilization (Chapter 9 of AMOPS). The new policy will address the latest mobilization initiatives introduced by DOD, JCS, or the civil agencies.

General

COMMENT: Recommend that the connection be made with JIMPP. This was mentioned in passing, but the report should point out the various submodels in JIMPP and what data the Army might provide joint planners and what data the Army might require.

RESPONSE: JIMPP, if successful, will be the umbrella model which will use the requirements data generated by MOBNET. Without contrasting requirements and capability in the joint-service arena, such comparisons will have limited planning usefullness. The ability of the industrial base to support the Army's requirements must be viewed in the light of requirements to support all military services and, for that matter, the civil sector as well. We feel confident that MOBNET, conceptually, will provide JIMPP with compatible Army data. However, the development of MOBNET is a long-term undertaking. As development proceeds on both JIMPP and MOBNET, new protocols will surface to which the system developers must respond. Flexibility, therefore, will be key to the success of both MOBNET and JIMPP.

ANNEX C

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