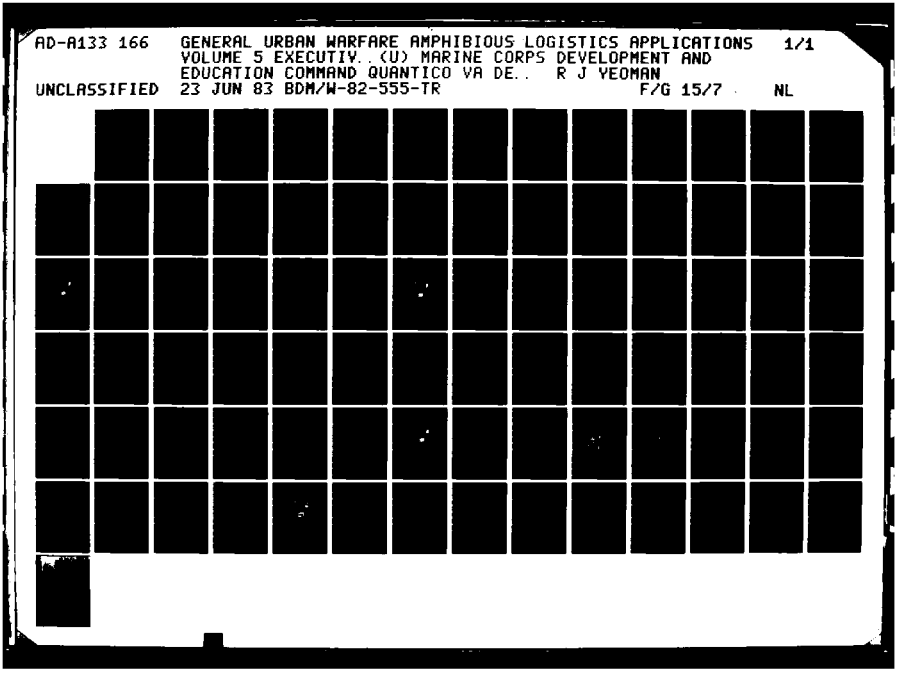
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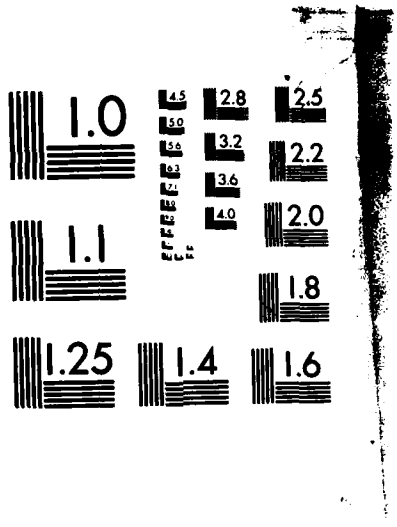

GENERAL URBAN WARFARE AMPHIBIOUS LOGISTICS APPLICATIONS
VOLUME V: EXECUTIVE SUMMARY

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JUNE 23, 1983

FINAL REPORT

UNLIMITED DISTRIBUTION

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UNITED STATES MARINE CORPS
MARINE CORPS DEVELOPMENT AND EDUCATION COMMAND
QUANTICO, VIRGINIA 22134

D 034/RJY/jmf
3913
10 August 1983

From: Commanding General
To: Distribution List

Subj: General Urban Warfare Amphibious Logistics Applications Study

1. The objectives of the study were:

a. Identify the role of logistics during combat in an urban area and isolate logistic peculiarities.

b. Identify requirements for specialized logistic concepts and systems for urban warfare.

c. Analyze present equipment inventories and mid-range equipment characteristics to satisfy urban area performance requirements and provide adequate throughput in an urban port facility.

d. Examine level of effort and support required by both the Naval Force and Landing Force/MAF to maintain command, control and coordination of logistics systems and equipment in an urban environment.

e. Evaluate performance capabilities and requirements of combat service support systems to function efficiently and effectively during operations in urban port areas.

f. Evaluate the capability of present state-of-the-art logistics systems to survive and operate in urban areas through all tempos of combat.

g. Develop land management techniques to provide combat service support in urban environments.

2. The objectives of the study were met.

3. The recommendations as set forth in the study are concurred in with the exception of recommendation 7.4.9. It is neither appropriate nor necessary to designate specific types of ships or aircraft to perform shuttle functions between the AOA and theater support facilities.

4. A copy of this letter will be affixed inside the front cover of each copy of the final report prior to its distribution.

J. E. HOPKINS
Deputy for Development

D 034/RJY/jmf
3913
10 August 1983

Subj: General Urban Warfare Amphibious Logistics Application Study

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GENERAL URBAN WARFARE
AMPHIBIOUS LOGISTICS APPLICATIONS
VOLUME V: EXECUTIVE SUMMARY

June 30, 1983

BDM/W-82-555-TR

Prepared for Naval Civil Engineering Laboratory, Port Hueneme, CA.

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1. EXECUTIVE SUMMARY

This section provides a summary of all work performed under NCEL Contract No. N68305-80-C-0015 "General Urban Warfare Amphibious Logistics Applications", in which The BDM Corporation was tasked to investigate the impact of an urban environment upon combat service support functions and systems. The overall study effort was undertaken in two sequential phases. Phase I was concerned with CSS during an amphibious assault and subsequent offensive operations in an urban area; Phase II focused on defensive CSS requirements. Each phase was documented in two volumes. One volume contained relevant operation plans keyed to designated tactical missions. The other volume was a technical report providing an in-depth analysis of urban CSS requirements and peculiarities. A complete documentation packet consists of Volumes I through V.

The Government provided the tactical missions from USMC SCN 30-77-01 "USMC Concepts of Operation for the Landing Force(s) in an Urban Environment During the Mid-Range." The scenario location was SYNTHETIC (SYN) City, an urban environment statistically synthesized from the physical characteristics of six real-world cities. The SYN City Data Base, developed under NCEL Contract No. N68305-79-C-0037, consisted of a 1:20,000 base map of the metropolitan area (See Figure A-1) with eleven overlays, two supplemental map products showing the environment up to 200 km distant from the city, and a numerical data booklet with additional and supporting data. Data available in the intelligence community relating to the SYN City Data Base that was appropriate for contractor use was also provided, in addition to access to the Defense Technical Information Center. The Government also provided the General and Special Situations and specified the relative size of Aggressor forces within and external to SYN City.

The development of logical combat and combat support schemes was necessary before a serious CSS investigation could begin. The study team was free to choose the particular offensive or defensive mission for the base-case analysis. The desire to model the worst-case urban CSS impact coupled with other tactical realities led to the selection of Deliberate Assault as

the offensive mission and Defense Inside the City as the defensive base-case mission. The study was deliberately structured so that combat occurred in the urban environment - no other alternatives (i.e., assault over conventional terrain flanking the city) existed.

One of the first conclusions reached during the study effort was that detailed urban terrain intelligence is required to formulate viable tactical and logistic plans. The SYN City Technical Data Base proved a useful technological base from which to address many tactical and logistic concepts. This data base was evaluated during each phase of the study and a summary evaluation apepars in Section 5.8 of this volume. Recommended enhancements include the provision of trafficability data, structural data, and ethnological data. This additional data may be provided as a general suppplement to the existing data or as contingency data on a case-by-case basis. Detailed logistic plans require the availability of detailed information concerning the urban area. This information is not always available, and the analyst must proceed with a best estimate. Pre-operation photographic imagery should be analyzed if available.

Combat in an urban environment is substantially different from combat occurring in conventional terrain. Combat and combat support techniques must be modified due to the presence of city structures and the indigenous populace. The urban environment has a mixed effect on the various CSS functions, and augmentation and/or concept changes are required in several functional areas to ensure adequate and timely CSS. It should be restated that the combat and combat support implications of urban combat are far more significant and crucial than are the CSS peculiarities.

The greatest urban CSS impact is found in the functional areas of CSS engineering, military police support, and civil affairs support. Units in each of these functional areas require extensive augmentation of a notional MAF structure to accomplish their respective missions in the SYN City scenarios, and would likely require a similar level of augmentation in other urban scenarios involving a MAF-level action. Engineer CSS augmentation, consisting of a Naval Construction Regiment, was necessary for the timely

development of CSS installations, rehabilitation of essential urban facilities, and installation of barriers and obstacles prior to the defense. Military police and civil affairs augmentation was dictated by the civil-military interface. Ethnological considerations influenced the level of MP and CA augmentation, while the type and condition of urban facilities dictated engineer CSS requirements.

Other CSS functions such as materials handling support, medical support, embarkation, and transportation were found to be problem areas but not urban-unique. The remainder of the CSS functions are not significantly affected by the urban environment and would be accomplished in the same manner as in a conventional environment. A brief summary of all CSS functional areas is presented in Section 5. Conclusions and recommendations are presented in Sections 6 and 7 respectively.

Many combat service support concepts developed for employment in nonurban scenarios require reevaluation in the urban context. The impact is greatest during defensive operations when consolidated CSSAs, normally established during previous combat periods, are not capable of providing the required level of support during periods of intense interdiction. Accordingly, the defensive CSS concept provides for the decentralization of selected CSS activities, forward stockage of critical supply items, and maximum use of indigenous facilities and structures for CSS purposes. The city infrastructure influences the degree of decentralization and the location of supply stockage points.

Most CSS elements and organization equipment are basically compatible with operations in an urban environment. The potential survivability of CSS elements and facilities increases in an urban area where protection from direct and indirect fires is offered by proximate structures. The most crucial equipment deficiencies centered about the current lack of motor transport and materials handling equipment compatible with containerized operations. With proper personnel and/or equipment augmentation (see Section 5 this volume), units responsible for CSS functional areas are capable of meeting <u>all</u> stated or implied urban CSS requirements.

Resources typically available in an urban environment provide many level-of-effort economies for CSS units. Well-developed LOCs and numerous structures suitable for military purposes reduce the potential engineering burden on the Landing Force and provide shelter for CSS units. The allocation of land and structural resources depends principally on the location of the resource in relation to the Forward Defense Area and FEBA. Prioritized management considerations provide a method by which indigenous resources are assigned for combat, combat support, and/or combat service support purposes. The management problem is most acute during defensive operations where the bulk of the defending force is deployed within the city.

JCS Pub 1 defines a logistic planning factor as a properly selected multiplier used in planning to estimate the amount and type of effort involved in a contemplated operation. The analysis of supply planning factors and usage rates relative to urban combat revealed a potential for significant deviations from current planning factors applicable in a conventional environment. The urban planning factors derived for Classes I and III(W) were lower than their conventional counterparts; Class III(A), IV, V(A), VI, VIII, and IX planning factors were approximately the same for SYN City and conventional scenarios; Class II, V(W), and VII urban planning factors slightly exceeded conventional planning factors.

During the course of the study effort, many topics were addressed and recommendations to CSS concepts, organizations, and planning facotrs were made when possible. Organizational and conceptual recomendations are summarized in Section 7 of this volume. These recommendations, as well as supply planning factors summarized in Section 5.5, should be reviewed by appropriate USMC elements for modification to existing doctrine and/or contingency planning procedures. It is recommended that this report be given the widest dissemination possible in order to stimulate thought concerning urban CSS and provide comments for future evaluation.

In conclusion, it was the opinion of the study team that the normal MAF structure must be augmented in order to provide the CSS capabilities required in an urban environment, given probable mission directives and

threat deployments. Augmentation requirements are most critical in the engineering, civil affairs, military police, and medical functional areas. Equipment deficiencies (MT and MHE) are caused by container compatibility considerations rather than the urban environment. Once appropriately task-organized and equipped for container operations, the MAF is fully capable of interfacing with an urban port and providing an adequate level of combat service support. Figure EX-1 below provides a graphic summary of the CSS impact resulting from urban operations.

CSS FUNCTION	URBAN MSNT [1]		URBAN CSS DEFICIENCY			SYSTEM ANALYSIS[3]					OVERALL URBAN IMPACT
	OFFENSE	DEFENSE	EQUIPMENT	ORGANIZATION[2]	TRAINING	SURVIVABILITY	COMPATIBILITY	EFFECTIVENESS W/MHE/MHE	RESOURCE IMPACT	SIGNIFICANT HID. RANGE IMPACT	
ENGINEER	I	D		X	X	●	●	●	L,S	YES	HIGH
CIVIL AFFAIRS	[illegible]	[illegible]TY		X	X	●	●	●	H,L,S		HIGH
MILITARY POLICE	I	I		X	X	●	●	●	H,S		HIGH
MATERIAL HANDLING	SC	I	X			●	●	●	S	YES	★
MEDICAL	SC	SC		X		●	●	●	H,S	YES	★
SUPPLY	SC	CC			X	●	●	●	L,S		MODERATE
TRANSPORTATION	SC	D	X		X	●	●	●	S	YES	MODERATE
LANDING SUPT	SC	SC	X			●	●	●	H,S	YES	LOW
NON-TAC COMM	SC	SC	X		X	●	○	○	S	YES	MODERATE
MAINTENANCE	SC	CC			X	●	●	●	L,S	YES	MODERATE
GRAVES REG	SC	SC		X		●	●	●	L,S		MODERATE
CBR TNG	I	I			X	●	●	●	H,S		MODERATE
LEGAL	I	I		X		●	●	●	H,L,S		MODERATE
EMBARKATION	I	I	X	X		●	●	●	H,L,S	YES	★
FINAN MGMT	SC	SC				●	●	●	H,L,S		LOW
ADPS	SC	SC				●	●	●	S	YES	LOW
DENTAL	SC	SC				●	●	●	S		LOW
FOOD SERVICE	SC	SC				●	●	●	S	YES	LOW
POSTAL	SC	SC				●	●	●	S		LOW
ADMINISTRATION	SC	SC				●	●	●	S		LOW
BAND	SC	SC				●	●	●	S		LOW
EXCHANGE SVC	SC	SC				●	●	●	S		LOW
SPEC SVC CLUBS	SC	SC				●	●	●	S		LOW
ECCLESIASTICAL	SC	SC				●	●	●	H,S		LOW
FIREFIGHTING	I	I	X	X	X	●	●	●	H,S		HIGH

KEY:

D - DECREASE
I - INCREASE
H - HUMAN
L - LAND
S - STRUCTURAL

CC - CONCEPT CHANGE
SC - SAME AS CONVENTIONAL

X - IDENTIFIED DEFICIENCIES
● - ADEQUATE
○ - MARGINALLY ADEQUATE
★ - PROBLEM AREA NOT URBAN-UNIQUE

NOTES:

1. MISSION: OFFENSE--DELIB ASSLT (D TO D+10),
   DEFENSE--DEFENSE INSIDE THE CITY (D+11 TO D+40)
2. AS COMPARED WITH NOTIONAL MAF T/O
3. MAJOR CSS FUNCTIONAL SYSTEMS, RELATED TO URBAN WARFARE REQUIREMENTS, ONCE RECOMMENDED CONCEPT, ORGANIZATIONAL, AND EQUIPMENT CHANGES HAVE BEEN EFFECTED

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Figure EX-1. Impact of Urban Environment Upon CSS Functions

SUMMARY TEXT

2. STUDY OBJECTIVES AND TECHNICAL REQUIREMENTS

The following general study objectives and specific technical requirements were given in the Statement of Work for Contract No. N68305-80-C-0015.

2.1 OBJECTIVES

- Identify the role of logistics during combat in an urban area and isolate logistic peculiarities.
- Identify requirements for specialized logistic concepts and systems for urban warfare.
- Analyze present equipment inventories and mid-range equipment characteristics to satisfy urban area performance requirements and provide adequate throughput in an urban port facility.
- Examine level of effort and support required by both the Naval Force and Landing Force/VII MAF to maintain command, control and coordination of logistics systems and equipment in an urban environment.
- Evaluate performance capabilities and requirements of combat service support systems to function efficiently and effectively during operations in urban port areas.
- Evaluate the capability of present state-of-the-art logistics systems to survive and operate in urban areas through all tempos of combat.
- Develop land management techniques to provide combat service support in urban environments.

2.2 TECHNICAL REQUIREMENTS

- The required CSS methodologies, planning criteria, and planning factors shall be developed from operational and logistic plans resulting from evaluated and approved concept statements. Five offensive and six defensive schemes of maneuver were specified for each time frame. (See Figure A-2)

- All functions defined in FMFM 4-1, "Combat Service Support for MAGTF (Draft), " shall be defined in detail as to when and what extent these functions relate to combat in an urban area.

- The definition of support functions shall include quantitites, levels of effort, and support necessary for the Naval and USMC forces to provide complete combat service support.

- All CSS requirements or lack of requirements shall be identified.

- All deficiencies identified by the contractor shall be noted and wherever possible remedial recommendations shall be made.

- Usage rates for all classes of supply shall be developed by the contractor for operations in the SYN City environment.

- All equipment, techniques, and methodologies shall be capable of functioning successfully within the 10th and 90th percentile range of the parameters identified in the data base for SYN City.

- Planning considerations, methodology, and prioritized planning criteria shall be developed to provide for the requirements.

- All data base elements utilized shall be noted as well as all missing or desirable data elements which could have enriched the final documents.

Schemes of Maneuver Evaluated (From SCN 30-77-01)

Offense	Defense
Deliberate Assault	Defense Inside the City
Seize Key Objectives	Defense in Depth
Isolate and Contain	Defend Key Sectors
Seize a Corridor	Mobile Defense
Reduce Defenses	Entrap and Ambush
	Defense Outside the City

3. MAJOR FACTORS BEARING ON THE STUDY

3.1 This subsection will note major factors, excluding study objectives and technical requirements, that have a measurable impact on the study effort. The factors are ordered in terms of relative importance or impact. Assumptions will be detailed in the following subsection.

3.2 GENERAL FACTORS

3.2.1 The contractor was directed to undertake the overall study effort in two sequential phases. Phase I was an examination of logistic requirements during the amphibious assault into an urban environment. Upon completion of the Phase I effort, the study team was then directed to examine logistic requirements during the defense of that same urban environment. Thus, the conduct of the offense was not dependent upon the defensive mission issued on D+10, and logistic development during the assault phase was keyed to the follow-on mission of attack to the northwest vice defend in place.

3.2.2 The Government and the contractor agreed early-on that each phase of the study effort was to be documented in two volumes: one volume containing detailed OPLANs corresponding to urban warfare concepts presented in USMC SCN 30-77-01, and one volume containing a technical discussion of the subject matter presented in the OPLANs. Furthermore, both parties concluded that the sheer volume of eleven detailed OPLANs (five offense, six defense) was unnecessary due to the commonality of many of the assigned missions. Accordingly, one detailed OPLAN was prepared for each of the base-case missions (Deliberate Assault, Defense Inside the City) while concept and outline plans provided an expedient tool to compare other missions to the base-case mission.

3.2.3 Although the thrust of the study effort was urban logistics and organic combat service support system capabilities in such an environment, it was necessary to develop logical combat and combat support schemes before the CSS analysis could begin. An extensive literature search revealed many sources of general information pertinent to urban warfare, although most articles did not contain any detailed information concerning specific urban logistic peculiarities. The development of combat and combat support schemes required an extensive effort that was necessary to lay a basis for the CSS analysis.

3.2.4 The study team recognized early-on that many of the CSS subject areas were not urban-unique while others were critical in the urban environment. Given the overall level of effort and scope of the contract, those subject areas that were considered urban-unique were accorded a greater level of analysis appropriate to their urban criticality.

3.2.5 Doctrinal references furnished or available to the contractor provided general information applicable to particular subject areas. Detailed planning criteria were not evident in any of the doctrinal references, and in many instances it was necessary to develop these criteria and associated planning factors for a conventional environment and then make modifications or allowances for the urban environment.

3.2.6 The SYN City Data Base, developed under Contract N68305-79-C-0037, was extremely useful during the course of the study effort. Areas of data deficiency were noted during the course of the analysis and logical assumptions were made where required to complete a detailed analysis. These assumptions are provided in the following subsection. Recommendations for data base improvement are provided in Section 5.8 of this volume as well as in Chapter VIII of Volumes I and III.

3.2.7 This Executive Summary Volume is intended to summarize all efforts performed under Contract N68305-80-C-0015. As with any other field of endeavor, additional insights and general knowledge were continuously accumulated over the duration of the study effort. For example, it was found that logistic planing for both offensive and defensive schemes of maneuver is necessary prior to the selection of an initial CSS concept supportive of all probable missions. With prior knowledge of the Phase II defensive CSS requirements, it might have been possible to "fine-tune" the Phase I offensive CSS concept to minimize problems encountered in the transition from an offensive to a defensive posture.

3.3 SPECIFIC FACTORS

3.3.1 The Landing Force was constrained to conduct an amphibious assault within the metropolitan limits of SYN City. The combination of generally adverse terrain conditions to the north of SYN City and the presence of an MRD(-) south of the city, coupled with the analytical desirability of urban operations, precluded initiating the amphibious assault outside the city. The Deliberate Assault mission (SCN 30-77-01) was selected as the offensive base-case. Similarly, five of the six defensive missions provided for an extensive use of the urban area for tactical and logistic purposes. The Defense Inside the City mission was selected for the defensive base-case. The base-case missions provided the greatest possible urban interface for the Landing Force/VII MAF and the greatest level of urban-unique CSS requirements.

3.3.2 The overall SYN City combat operation was arbitrarily divided into discrete periods having tactical or logistic similarities. The periods of action are noted below:

- Period I (D-5 to D-1) - Advance Force and Demonstration operations.
- Period II (D-day) - Deliberate Assault (AE) into SYN City.
- Period III (D+1 to D+3) - Consolidation of initial objectives, logistic support from BSAs.
- Period IV (D+4 to D+6) - Arrival of AFOE, establishment of CSSAs.
- Period V (D+7 to D+10) - MCATF opns, AFOE off-loading, hasty defense.
- Period VI (D+11 to D+15) - VII MAF ordered to defend, extensive MCATF opns, deployment into defensive posture.
- Period VII (D+16 to D+40) - Anticipated arrival of Aggressor at FEBA; Defense Inside the City.

3.3.3 Notional MAGTF Lift Fingerprints (DO34/JRQ/pdd - 23 Oct 80 and DO34/RLP/pdd - 12 Sept 80) were used to derive unit personnel strengths and general embarkation requirements.

4. ASSUMPTIONS

4.1 The following assumptions were made to facilitate a more precise definition of the scope and parameters of the study effort. Many of the assumptions were necessary to augment data contained within the SYN City Data Base and supplemental map products and facilitate more detailed analyses. Other assumptions are more concerned with the actual combat operations visualized by the study team, since subsequent actions and deployments were based on the success of earlier actions by both Aggressor and friendly forces.

4.2 ASSUMPTIONS COMMON TO PHASES I AND II.

4.2.1 Successful formation, embarkation, and transoceanic deployment of representative composite MAF. (See Figure A-3)

4.2.2 Availability of desired augmentation elements (NCR, CAG, MP).

4.2.3 Inshore channel depths permit selected utilization of floating causeways supplemented by float bridging.

4.2.4 Deployment of Aggressor units within and without SYN City.

4.2.5 Successful landing of Assault Echelon (AE) and Assault Follow-On Echelon (AFOE).

4.2.6 Representative building types, profiles, and construction materials.

4.2.7 Trafficability characteristics outside SYN City metropolitan area.

4.2.8 Manageable hostility level in indigenous populace; civil cooperation for essential utilities, public safety, and public health.

4.2.9 No mass exodus of SYN City civilians to locations outside the city.

4.2.10 No extensive blockage of port channels by submerged vessels.

4.2.11 Aggressor denial of bulk fuel complex, railroad locomotives, port MHE, and essential military items (weapons, ammunition).

4.2.12 Friendly theater airbase and support facilities 170nm from SYN City.

4.3 ASSUMPTIONS APPLICABLE TO PHASE I (OFFENSE).

4.3.1 Damage to main port area sufficiently reparable or cleared by D+5 to permit unloading AFOE.

4.3.2 Rehabilitation of Airfields 1 and 2 landing surfaces within NMCB capabilities and accomplished by late on D+10.

4.3.3 Deployment and subsequent actions of Aggressor Motorized Rifle Battalion (MRB) elements remaining in SYN City after initial amphibious assault (i.e., Appendix B Mini-Scenarios to Vol I).

4.4 ASSUMPTIONS APPLICABLE TO PHASE II (DEFENSE)

4.4.1 Successful combat actions against and attrition of Aggressor parent MRD (Phase I).

4.4.2 Reconstitution of MAF at T/O strength prior to Aggressor arrival at FEBA.

4.4.3 Successful actions by GOP MCATFs in Security Zone, delaying Aggressor arrival at FEBA until D+16. Minimum delay time is 48 hours forward of GOPL and 24 hours from GOPL to FEBA.

4.4.4 Untenability of Airfields 1 and 2 subsequent to D+15.

4.4.5 Continuing support from ATF for air operations, naval gunfire support, casualty treatment, and lighterage.

4.4.6 Damage levels sustained during Phase I operations (port, airfields, utilities, lines of communication, etc.). (See Annex B to OPLAN 6-81 in Volume IV.)

4.4.7 SYN City situation on D+10 (issuance of defensive mission).

- Forward-deployed CSSAs not yet established.
- Construction of EAF 3 not started.
- Stockage level of 3 Days-of-Supply (DOS) within FBH.
- Installation of Elevated Causeways (ELCAS) 1 and 2 complete.
- Amphibious Assault Fuel Supply Facility (AAFSF) installed; ready for conversion to Amphibious Tanker Terminal Facility (ATTF).
- Relocation of 34,000 civilians from sensitive locations.
- 7th MAF emergency relief supplies for civilian support in process of distribution to civilian agencies.
- Airfields 1 & 2 operable and supporting 7th MAW assets operating ashore.
- Forward elements of 2 Aggressor MRDs and 1 Abn Div 150 km distant and converging on SYN City.

5. DISCUSSION

5.1 OPERATIONAL CONSIDERATIONS - CURRENT PERIOD

Although the focus of this study effort was on logistic requirements supporting combat operations in an urban environment, logical schemes of maneuver and defensive deployments were formulated upon which to base urban CSS requirements. This subsection will note some of the prominent operational considerations that resulted during the tactical analysis of the overall SYN City operation. These considerations, while valid for the SYN City scenario, will require reexamination and possible modifications in other scenarios.

5.1.1 OFFENSIVE OPERATIONS

5.1.1.1 The selection of a Deliberate Assault as the base-case mission resulted from an extensive analysis of natural and man-made features of SYN City and the area within 30 km of the city. The lack of suitable landing beaches north of the city and the presence of an MRD(-) south of the city, coupled with key objectives within the city, argued in favor of assaulting directly into the urban area. The location of assigned objectives within the city and the threat posed by the approaching MRD provided further arguments for a Deliberate Assault mission vice other tactical initiatives. Finally, the deliberate assault and subsequent consolidation of SYN City provided the greatest urban interface with the Landing Force and an opportunity for examination of urban CSS requirements. (See Figure A-4)

5.1.1.2 Viable Advance Force and Demonstration Operations are necessary to prevent or delay Aggressor reinforcement of units deployed within SYN City. Extensive air operations supported from theater airbases and the Carrier Battle Group are intended to attrite Aggressor armor and force early deployment of reinforcing units. These operations are also intended to deceive the enemy as to the location of the actual assault.

5.1.1.3 The actual assault should be conducted during hours of darkness and reduced visibility to degrade Aggressor target acquisition and air defense systems. A successful pre-dawn assault into an unfamiliar urban area requires extensive intelligence gathering efforts, rehearsals, and detailed briefings for commanders and staffs of units in the initial assault waves. This requirement is not urban-unique but is increased in an urban environment with dense construction and varying building profiles. The availability of enhanced map products would facilitate the briefing process.

5.1.1.4 Heliborne operations are necessary to seize inland objectives and isolate the urban area swiftly. The city infrastructure and assets available to the Landing Force will determine the extent of heliborne assault operations. In general, a large urban area requires extensive heliborne operations to seize key objectives within the city and on the inland metropolitan boundary. Helicopter Support Teams provide the means to terminally

guide and logistically support these forces until additional city areas have been consolidated and overland resupply is possible.

5.1.1.5 Pre-assault preparatory fires and subsequent supporting fires should be restricted to known target areas to minimize damage to essential facilities, reduce rubble, and minimize civilian casualties. These restrictions will reduce the engineering burden on the Landing Force and civil support requirements, especially if a long-term (> 30 days) occupation of the city is contemplated. Terminally guided munitions and direct fire weapons provide the most precise means to reduce defenses while minimizing collateral damage. The utility of each urban facility or area should be considered before and during the targetting process.

5.1.1.6 The presence of an extremely aggressive and hostile populace may provide an argument for the selection of an offensive mission minimizing civilian contact while achieving the designated objectives. Fanatical opposition to the Landing Force presence would present internal security requirements far in excess of initial LF capabilities. A Deliberate Assault mission should be avoided under these circumstances. Given the SYN City scenario, seizure of a corridor running from the main port area through Airfield I would minimize civilian contact, secure essential logistic facilities, reduce assault and civil support requirements, and provide for the landing of follow-on forces.

5.1.1.7 Isolation of an urban area, while generally required to fulfill tactical objectives, generates an increased reliance by the indigeous populace on external (friendly) support for foodstuffs and medical items. One of the EEI for in-country agents should be the food stockage level and distribution system. This knowledge will be useful in tailoring external support mechanisms.

5.1.1.8 Air superiority is essential through D+5 to successfully accomplish an amphibious assault into an urban area. V/STOL sites within the FBH are required early-on to facilitate air operations and clear deck spaces on amphibious helicopter platforms.

ESSENTIAL OPERATIONAL CONSIDERATIONS - URBAN OFFENSE

- Physical characteristics of city and approaches to city.
- Swift isolation of city and prevention of reinforcing efforts.
- Well-planned and well-executed surface and heliborne assaults during reduced visibility.
- Careful employment of pre-assault preparatory fires.
- Early seizure of key facilities that are essential to LF operations.
- Accurate ethnological intelligence.
- Initial air superiority; early establishment of V/STOL sites within FBH.

5.1. OPERATIONAL CONSIDERATIONS - CURRENT PERIOD (CONTINUED)

5.1.2 DEFENSIVE OPERATIONS

5.1.2.1 The selection of a base-case mission for the defense of SYN City was heavily influenced by the composition of and courses of action available to the newly designated Aggressor threat of Combined Arms Army size. When VII MAF received the mission to defend late on D+10, this threat was 150 km distant from SYN City. (See Figure A-5)

a. The short time available for unit deployments and logistic buildup did not favor selection of a Defense Outside the City. Further, a defense outside the city would not stress the urban-unique CSS requirements which were an objective of this study. This mission may provide for a viable defense in other scenarios but requires narrow approach corridors or mobility characteristics not typically organic to USMC regiments. The mobility could be provided by either truck or helicopter assets.

b. In port cities with a relatively short distance (5 km) from the inland metropolitan boundary to the water's edge, the Mobile Defense and Entrap and Ambush missions may not be viable options in that successful Aggressor penetrations followed by unsuccessful MAF ambushes/ counterattacks would provide the Aggressor with a defensible foothold within the city. Dislodgement would be difficult. The probability of Aggressor penetrations near key sectors within SYN City favored an in-depth defensive posture. The Mobile Defense would be most successful in relatively open areas of the city and then as a gambit used in conjunction with other defensive means.

c. The Defense Inside the City and Defense in Depth missions, as outlined in SCN 30-77-01, appeared identical at MAF level. Defense Inside the City was selected as the base-case mission because it provided the most logical continuity between Phases I and II and incorporated elements of the other defensive mission types.

5.1.2.2 In scenarios where an assaulting force is ordered to undertake the deliberate defense of an urban area against a numerically superior aggressor, adequate time may not be available to complete defensive preparations within the city to include the development of strongpoint positions, deployment of subordinate units, installation of obstacles and barriers, and stockage of essential supplies. Additionally, the Aggressor force will generally be well-armored with an impressive organic artillery capability. The deployment of tank-heavy MCATFs into the MAF Security Zone for all of the defensive missions was intended to gain time for defensive preparations as well as attrite Aggressor armor and artillery before they came within effective range of the FEBA. The Aggressor must be denied the offensive option of "Reducing Defenses".

5.1.2.3 The city infrastructure will determine which installations/areas can be successfully defended and which will be subject to early capture and

denial by Aggressor forces. Those key sectors or activities located proximate to the metropolitan boundary/FEBA are vulnerable to Aggressor penetration and should be relocated if possible. In the SYN City defensive scenario, analysts anticipated that Airfields 1 and 2 would become untenable by D+16 unless extraordinary measures were taken to retain and rehabilitate these landing surfaces. Retention of the SYN City airfields was considered to be possible only with the establishment of major defensive strongpoints outside the city.

5.1.2.4 As with most other defense scenarios, urban defensive forces should be oriented on major approach corridors and deployed in depth forward of key defense objectives whose retention is considered feasible. In the SYN City defense scenario, the primary ground approach corridors trend from the northwest and southwest into SYN City with additional threats posed by airborne and ACV landings. Antilanding defenses should be prepared to preclude successful Aggressor landings in the main port area and CSS areas nearby.

5.1.2.5 The adoption of any defensive missions within the city should be accompanied by the formation of strong mobile reserves/strike forces in areas amenable to the use of armor, such as industrial zones, broad parklands, or other relatively open areas. These strike forces should be task-organized from armored assets organic to the division and tasked to counterattack mechanized penetrations of the FEBA, conduct ambushes, and provide fire support to dismounted infantry occupying strongpoint positions along the FEBA. The MAF commander must decide when to disengage GOP MCATFs so that there are sufficient assets available from which to organize mobile reserves.

5.1.2.6 The evacuation of civilians from the FEBA may be necessary in inner-city defensive missions to maintain operations security, develop defensive positions and barriers, and comply with humanitarian provisions of international law. The extent of this evacuation will be dictated by the nature of the enemy threat, the city infrastructure, attitudes of the populace, time available to complete the evacuation, and capacity of DPRE relocation sites.

ESSENTIAL OPERATIONAL CONSIDERATIONS - URBAN DEFENSE

- Time available and city infrastructure dictate defensive mission type.
- Deployment of tank-heavy MCATFs into MAF Security Zone is essential.
- Key objectives on the metropolitan fringe may be difficult to retain under intense pressure.
- Strongpoint defenses should be oriented on anticipated approach corridors, and antilanding defenses should be prepared.
- Strong mobile reserve/strike forces should be task-organized if urban terrain includes areas suitable for mechanized operations.
- Evacuation of civilians from FEBA may be desirable.

5.2 OPERATIONAL CONSIDERATIONS - MID-RANGE PERIOD

5.2.1 OFFENSIVE OPERATIONS

5.2.1.1 The Landing Craft Air Cushion (LCAC) will provide a heavy-lift, high-speed, relatively long-range, across-the-beach, surface delivery vehicle for moving personnel, weapons, cargo and heavy equipment from ship to shore. The LCAC will quadruple the number of possible landing sites worldwide and allow units and equipment to be landed directly on the SYN City mainland, thereby reducing or eliminating the need for causeway/float bridge support at the inshore channels. An over-the-horizon launch capability will permit a deeper Sea Echelon and additional maneuvering room for deep-draft vessels operating in mild hydrographic gradients. The use of the LCAC during the assault landing will enable the tactical commander to achieve a more rapid buildup of combat power and facilitate tactical surprise.

5.2.1.2 The CH-53E heavy-lift helicopter, with an anticipated 16-ton lift capability, will also permit more effective utilization of a sea-based logistic system during the early stages of an amphibious assault. The CH-53E will be used during the initial heliborne waves to lift light armor and towed artillery to inland locations thereby placing a more capable force in positions to isolate the urban area and attrite initial enemy reinforcements. Following the landing of initial heliborne waves and the delivery of emergency supplies to inland locations, the heavy-lift helicopter can be used to lift light armor and/or artillery for raids/ambushes outside of the city proper.

5.2.1.3 The fielding of a light armored vehicle (LAV) will provide additional flexibility and firepower during an urban assault. The LAV's greatest contribution to offensive operations would be in its employment (with the CH-53E) to isolate the urban area and conduct combined arms operations in conventional terrain outside the city on D-day. Within the city, the LAV is expected to possess better mobility characteristics than the LVT or MBT, provide additional fire suppression for mounted or dismounted operations, and provide protection against small arms and airburst artillery fires. A swim capability would prove useful in river and lake crossings.

5.2.1.4 The Shoulder-Launched Multi-Purpose Assault Weapon (SMAW) should provide a "bunker busting" and wall-breaching capability that is sorely needed in urban combat. This weapon, probably organic to infantry and engineer units, will provide more responsive assault support than is currently available with conventional breaching techniques.

5.2.2 DEFENSIVE OPERATIONS

5.2.2.1 The majority of comments offered in section 5.2.1 remain applicable to the utility of these systems during the defense of an urban area. The capability to lift light armor into the enemy's rear will serve to disrupt Aggressor C^3 and logistic efforts as well as attrite enemy armor.

5.2.2.2 The addition of a Light Armored Assault (LAA) Bn within the composite MAF will provide additional armored resources from which to form mobile reserve/strike forces. Tactical commanders may be in a better position to execute local counterattacks and ambushes with the additional resources provided by this unit. Patrolling of inner-city areas will be facilitated by the LAV, offering self-protection for mounted infantry or fire support for dismounted infantry.

5.2.2.3 The assignment of additional ATGM assets to the infantry regiments will provide the additional punch necessary to destroy Aggressor armor before it has a chance to penetrate the FEBA and enter the city. Man-portable ATGMs will be most useful within the city, as they can be deployed within buildings, behind rubble, and on rooftops. Vehicular-mounted ATGMs, such as the TOW system, are not as versatile within the city and their current support vehicles provide little protection for the firing team.

5.2.2.4 The introduction of the Squad Automatic Weapon (SAW), SMAW, and MK 19 machinegun coupled with the reorganization of the infantry battalion will enable the tactical commander to defend a larger area with the same relative-size element. The increased firepower available to the fire team (SAW, M203, M16) will provide a smaller-sized element with the same munitions-delivery capability as is currently available to the larger fire team. Urban combat generally involves many small-unit actions as buildings and blocks are converted into killing zones; the reorganized infantry battalion will be more capable of defensive combat in this environment.

5.3 LOGISTIC CONSIDERATIONS - CURRENT PERIOD*

5.3.1 OFFENSIVE OPERATIONS

5.3.1.1 CSS Concept - The basic combat service support concepts recommended for amphibious assaults into and subsequent offensive actions within an urban environment remain basically the same as those for offensive actions in a conventional environment. Differences lie in the potential availability of indigenous facilities, structures, and equipment that could be utilized by the Landing Force to further logistic efforts, as well as the presence of civilians who would require evacuation and relocation from areas designated for military-only purposes (i.e., defensive positions, CSS activities).

VII MAF arrives in the AOA with Landing Force supplies spread-loaded in the Assault Echelon to minimize risk of catastrophic loss of material due to enemy action. Prior to H-hour on D-day at a time to be announced, individual prescribed loads will be issued and emergency supplies will be prepositioned for helicopter delivery. LFSP elements will land over RED and BLUE Beaches and in designated Landing Zones to establish prescribed BSAs and HSTs and maintain required dump levels. Helicopter-landed units will be resupplied by helicopter until surface-landed forces have linked up and opened surface LOCs. BSAs at RED and BLUE beaches will support the surface-landed forces. Due to the difficulty in transiting the inland waterways between the islands and the mainland, LVTs will be assigned as floating dumps as soon as released by assault units, and they will be kept in mobile-loaded status for as long as possible.

LFSP will provide for necessary CSS in accordance with the Oplan. Assault elements will receive unit distribution to the maximum extent possible throughout Periods II and III (D-day, D+1 to D+3). All other units will have supply point distribution. On order, FSSG will land, relieve LFSP, and assume control of CSS elements of VII MAF. As the tactical situation permits, FSSG establishes CSSAs 1 and 2, maintains specified dump levels, and performs other CSS functions as required. FSSG will provide support of civil affairs actions as required on order of VII MAF. In the event the enemy employs nuclear and/or chemical weapons which disrupt the ship-to-shore movement, the CATF will evaluate the situation and implement recovery procedures as necessary.

The follow-on mission assigned to the Landing Force will have a considerable impact upon the further development of CSS activities within the city. If the MAF is ordered to continue the attack inland then forward-deployed CSSAs will be required in proximity to the FBHL. Long-haul transport requirements increase markedly unless an EAF is established or available inland. On the other hand, if the MAF is initially ordered to undertake the deliberate defense of the city then a decentralization of CSS will be necessary to assure an adequate level of CSS under all tempos of combat. See Section 5.3.2 for a description of the CSS system recommended for urban defensive operations.

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* Conclusions and recommendations pertaining to Section 5.3 are presented in Sections 6 and 7, respectively.

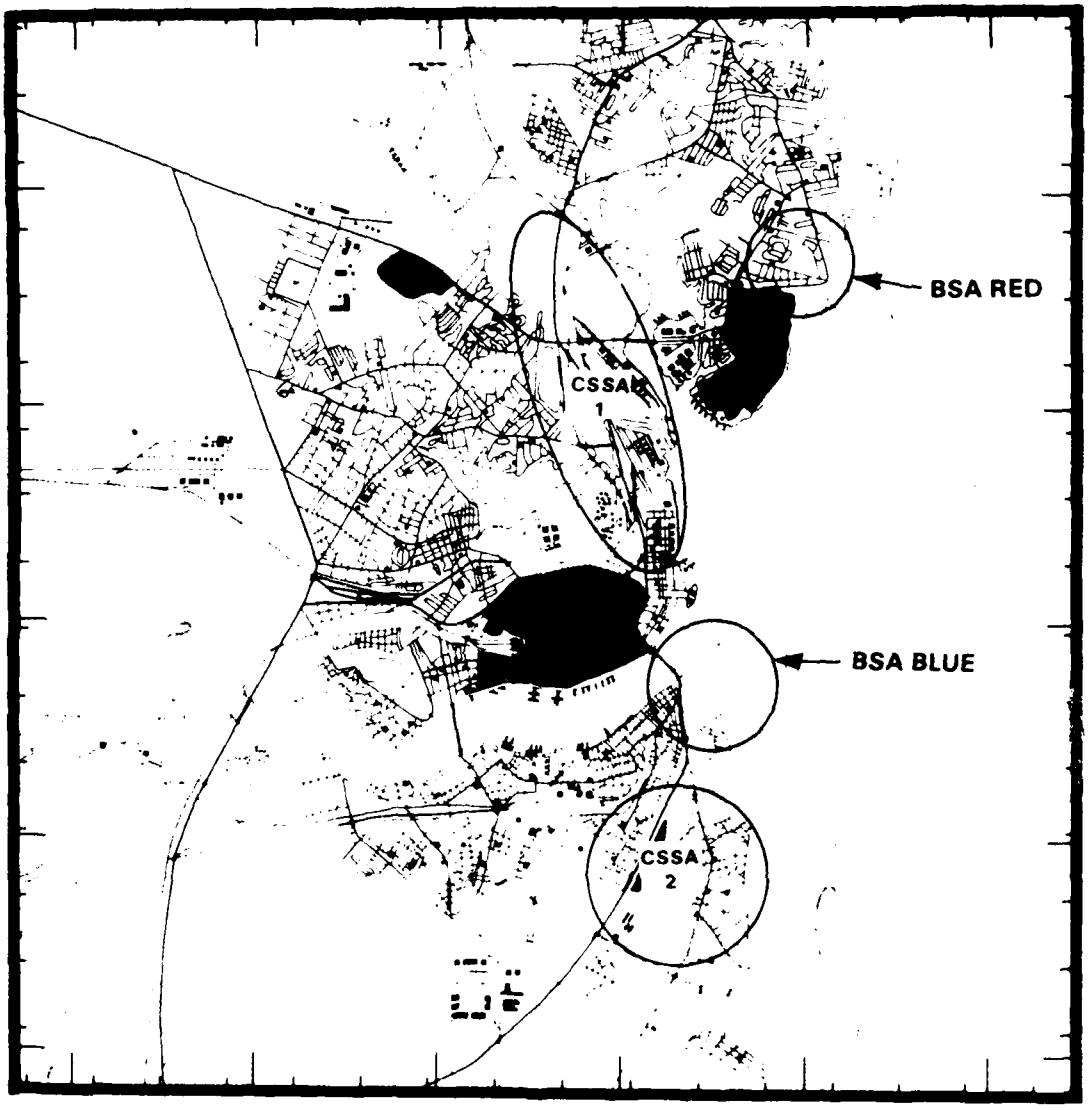


Figure EX-2. Initial Combat Service Support Areas

5.3.1.2 CSS ANALYSIS-OFFENSE

This subsection will summarize the combat service support considerations pursuant to a MAF-level Deliberate Assault into an urban environment (SYN City). The selection of other offensive schemes of maneuver would cause minor changes in overall CSS levels. The considerations given below should be applied on a case-by-case basis once the actual urban objective had been specified. Detailed pre-operation intelligence gathering is essential in any operation to allow CSS planners to quantify anticipated military and civilian support levels and task-organize CSS elements prior to embarkation.

a. Engineer CSS - Although the urban environment may provide many extant facilities that would be useful in CSS efforts, many of these facilities would suffer damage or denial during the course of the amphibious assault. The principal engineer CSS tasks during offensive operations are to assist with the development of BSAs and CSSAs, rehabilitate or construct airfields, and rehabilitate essential areas of the main port prior to the arrival of the AFOE. Utility support requirements are not appreciably different from those in a conventional environment. Bulk fuel facilities are progressively established proximate to designated CSS activities; indigenous storage facilities will be used if feasible. Bulk fuel planning during the offensive phase should be similar to that in a conventional environment unless the follow-on mission is defensive in nature. The overall engineer CSS requirements peak during Period V (D+7 to D+10) at the same time as the last engineer CSS elements are being phased ashore.

b. Civil Affairs Support - Military operations in an urban area will be facilitated if a viable interface exists between the CLF and the indigenous government. While the Landing Force could possibly accomplish its assigned mission without this interface, the presence of personnel trained in civil affairs specialty functions would act as a combat multiplier facilitating combat operations while monitoring the public welfare as required under international law. The hostility level in the indigenous populace and the extent of their cooperation to continue to provide for their own welfare relate directly to the level of civil affairs personnel necessary to provide the required interface. Civil affairs support planning during the offensive should consider possible requirements during a long-term defense of the same area, and procedures and practices should allow for a smooth transition to whichever follow-on mission is directed.

c. Military Police Support - Military police requirements are substantially increased in an urban area where civilians must be evacuated, relocated, and controlled so that they do not hinder combat operations. Additionally, it is desirable to minimize unauthorized military-civilian contact to reduce the military crime rate. Military police elements also act as a force multiplier in the urban context.

d. Supply Support - Normal supply support procedures and expedients are applicable during an amphibious assault into an urban area. The urban influence is found in the availability of indigenous structures in which to store supplies, the availability of local materials with military (and civilian) applicability, and the unavailability of selected items found to have special usefulness in the urban environment. (A defensive follow-on mission necessitates the establishment of decentralized supply storage and support points, vice consolidated CSS activities as noted during a strictly offensive-oriented analysis.) See Section 5.5 for a summary of urban logistic planning factors and usage rates.

e. Transportation - The transportation function is not significantly affected overall by the amphibious assault into an urban area. Transport requirements supporting the embarkation and transoceanic deployment of VII MAF are indirectly affected by the presence of an urban objective. Once within the AOA, the city infrastructure will influence the selection of transport during the ship-to-shore movement of assault waves. Transport requirements outside the city occur in a conventional environment. The close-quarters situation within the city increases the required level of vehicle hardening as well as operator training. With regard to the CSS function, the impact of containerization is considered more significant than operations in an urban environment.

f. Landing Support - The plan for landing support is highly dependent upon the methods by which assault and follow-on forces are deployed into the FBH. The SYN City assault landing required the structuring of two Shore Party Teams and four Helicopter Support Teams all under the control of an austere Shore Party Group headquarters. The provisions for landing support during the SYN City assault were not significantly different than those which would have evolved in the absence of the urban area. Resources required to task-organize the Shore Party and Naval Beach Groups were not urban-unique and were within the combined capabilities of the FSSG and ATF.

g. Nontactical Communications - Radio communications will be degraded in an urban environment, and SYN City is no exception. Pending the introduction of more capable communications equipment and procedures, ad hoc measures will be necessary to ensure that effective communications are maintained within the city. The indigenous communications systems may be of value to coordinate public health and safety measures, but will not be used for operational or logistic purposes. The radio degradation problem may force a greater reliance on wire communications once ground lines of communication have been consolidated.

h. Maintenance Support - Maintenance operations and concepts during an urban offense are not substantially different from those during an amphibious assault into conventional terrain. Principal differences lie in the potential availability of indigenous structures suitable for maintenance purposes and a greater reliance on diagnosis and expedient repairs by forward-deployed maintenance contact teams. A greater incidence of glass breakage and tire replacement should be expected, and additional Class IX items should be embarked to cover this possibility.

5.3.1.2 CSS ANALYSIS-OFFENSE (CONTINUED)

i. Graves Registration - Graves registration procedures are more complicated in an urban environment when suggested criteria for temporary interment (ECP 1-1) cannot be met. The availability of proximate theater support facilities provides the opportunity to accomplish the initial processing of the deceased within the FBH with the final embalming and preparation being accomplished at a theater mortuary. A daily shuttle service will be used to transport the remains from SYN City to the theater facility. Refrigerated containers could be used to provide a storage buffer should the shuttle schedule be disrupted.

j. Combat Service Support Training - A number of potential CSS training deficiencies were noted during the analysis of urban offense CSS requirements. While none of the identified deficiencies would seriously degrade CSS operations, the identification of problem areas will hopefully cause concerned units to implement additional training prior to their deployment into an urban area. Combat and combat support training deficiencies were considered to be more crucial to the success of the offensive mission than were CSS training deficiencies. The most important CSS training topics include urban supply storage expedients, MT/MHE operations in confined areas, and urban communications expedients. Additional deficiencies are detailed in Volume III, Figure V-19.

k. Legal Support - Legal support requirements are expected to increase following an urban amphibious assault. This increase is caused by the inevitable unauthorized contact between servicemen and civilians as well as the legal claims resulting from the confiscation and/or destruction of civilian property. The legal support capabilities organic to the MAF (including the 4th CAG) are judged sufficient for urban operations lasting less than 15 days. Long-term urban offensive operations will require that additional legal teams for war crimes and courts martial be made available for arrival on or about D+10.

l. Embarkation - Embarkation planning culminating with the deliberate assault into an urban area encompasses the same considerations as with any other amphibious operation. In the final analysis, the embarkation plan must support the concept of operations. The embarkation capacity of amphibious shipping, normally available for such a scenario, was found to leave a shortfall of over 300,000 CF. Square and personnel capacities were considered adequate in the current period as well as the mid-range period. Ship-loading should reflect tactical and logistic requirements pursuant to an amphibious assault and initial combat operations ashore.

m. Materials Handling Support - The MAF must be self-sufficient in terms of MHE and equipment operations; indigenous MHE will likely be denied by the Aggressor. The landing of the AE, loaded breakbulk in amphibious shipping, was not significantly affected by the urban environment chosen for this scenario. Beach Support Areas (BSAs) were sited in

suburban areas and current MHE inventories will have no problem handling the landing and distribution of AE supplies. The landing of the AFOE and subsequent resupply echelons (containerization) will continue to be a problem area until rough terrain container handlers are procured and fielded. Current MHE inventories were found to be marginally adequate to handle large containers.

Indigenous docks and wharves not denied to the Landing Force will be used to complement Amphibious Logistics System (ALS) components embarked with the AE. Only two of the five elevated Causeway (ELCAS) systems normally required to offload the AFOE in a 10-day period were established at landing beaches near SYN City. Usable main port facilities provided the remainder of the interface necessary to assure an adequate throughput level.

n. Medical Support - An amphibious assault into an urban environment against a modern, well-equipped enemy is expected to produce a moderate level of casualties in the absence of extensive NBC warfare. The basic medical systems and operational concepts of FMF and DON medical elements remain applicable to this offensive scenario. Deficiencies in medical support were found to occur if the surgical percentage exceeded 27.5% or if any of the Casualty Treatment and Receiving Ships (CRTSs) were ordered to depart the AOA. The redeployment of CRTSs would produce a surgical and definitive care bed shortfall unless additional hospital units or a hospital ship were assigned to the LF/ATF. Casualty evacuation to theater medical facilities will be accomplished by surface shuttle, V/STOL assets, and MEDEVAC aircraft once the SYN City airfields can accept such platforms. The projected deficiences in medical support are not urban-unique but constitute a problem area in any MAF-level moderate casualty scenario.

o. Functions with LOW Urban Impact (Offense) - The following CSS functions are not significantly affected by an urban assault into an urban environment. These functions will continue to be performed in the same manner as in any other amphibious assault. Personnel should be provided with basic indoctrination concerning urban combat.

Financial Management	Administration
ADPS	Dental Service
Food Service	Ecclesiastical Services
	Postal Service

p. Functions NOT PROVIDED During Amphibious Assault - The following CSS functions would not be provided during the amphibious assault or initial offensive operations in any environment.

Exchange Services	Band (Primary mission)
Special Service Clubs	Passenger & Freight Transportation

5.3 LOGISTIC CONSIDERATIONS - CURRENT PERIOD (CONTINUED)

5.3.2 DEFENSIVE OPERATIONS

5.3.2.1 CSS Concept - The combat service support concept for all five missions of defense within the city is influenced to a great degree by the need to disperse supply stockages and CSS activities to preclude interdiction during intense inner-city fighting when all areas within the city may be within range of Aggressor mortars and artillery. A requirement also exists for the stockage of critical supplies (Classes I and V) at forward locations so that units in contact will be able to effect their own resupply until such time as normal distribution activities can continue. Selected supplies will be stockpiled at other forward sites so that units forced to conduct delaying actions will fall back on their supplies.

CSSAs 1 and 2, established during the offensive phase of the SYN City operation, will serve as the primary focal points for the offloading and marshalling of containerized supplies as well as the remainder of the AFOE. Elevated causeways (ELCAS) at Beaches RED and BLUE will augment the throughput capability within the main port area. The FSSG headquarters will remain in the port area as will the headquarters of subordinate FSSG battalions. MILVAN-sized containers will be offloaded from containerships or lighterage and transported to the container marshalling areas by container-compatible semi-trailer combinations. Once at the marshalling area, supplies may be stored within the large container or reconfigured into smaller-sized loads and transported to more forward stockage points.

Four Intermediate Support Points (ISPs) will be established in the suburban areas with one ISP in support of each regiment (three infantry regiments plus one artillery regiment). A full range of CSS will be available at each ISP to include maintenance, medical, engineer, supply, and motor transport services. The ISPs will serve as intermediate container handling areas where MILVAN or QUADCON-sized loads can be reconfigured, if necessary, as QUADCON or PALCON-sized loads ready for transport to forward units. FSSG slices (roughly equivalent to a MAU slice) will provide the CSS nucleus at each ISP supplemented by divisional and MAW CSS elements as required.

For supply dispersion purposes there are two additional echelons of supply stockages. Selected supplies will be stockpiled at approximately nine battalion-level locations as well as twenty-seven forward points. These forward support and stockage points are used primarily for supply stockage while the remainder of CSS is provided by activities located at ISPs and CSSAs. Supplies will be sited within structures whenever possible to protect them from observation, pilferage, and indirect fires.

Stockage levels at each logistic activity depend on the units being supported as well as the individual supply class. Class III (Bulk) and Class V supplies are dispersed at CSSAs and ISPs. Land area requirements for ammunition storage have been significantly reduced via the use of modular storage concepts. (See Figure A-6)

The locations for forward stockage points and CSS activities are influenced by the location and anticipated success of Aggressor efforts to penetrate the FEBA. The selection of a Mobile Defense or Entrap and Ambush posture rather than an area defense posture may force a reevaluation of forward CSS activity locations and the dispersion of supplies and activities at CSSA 2, located adjacent to the southern edge of the FEBA.

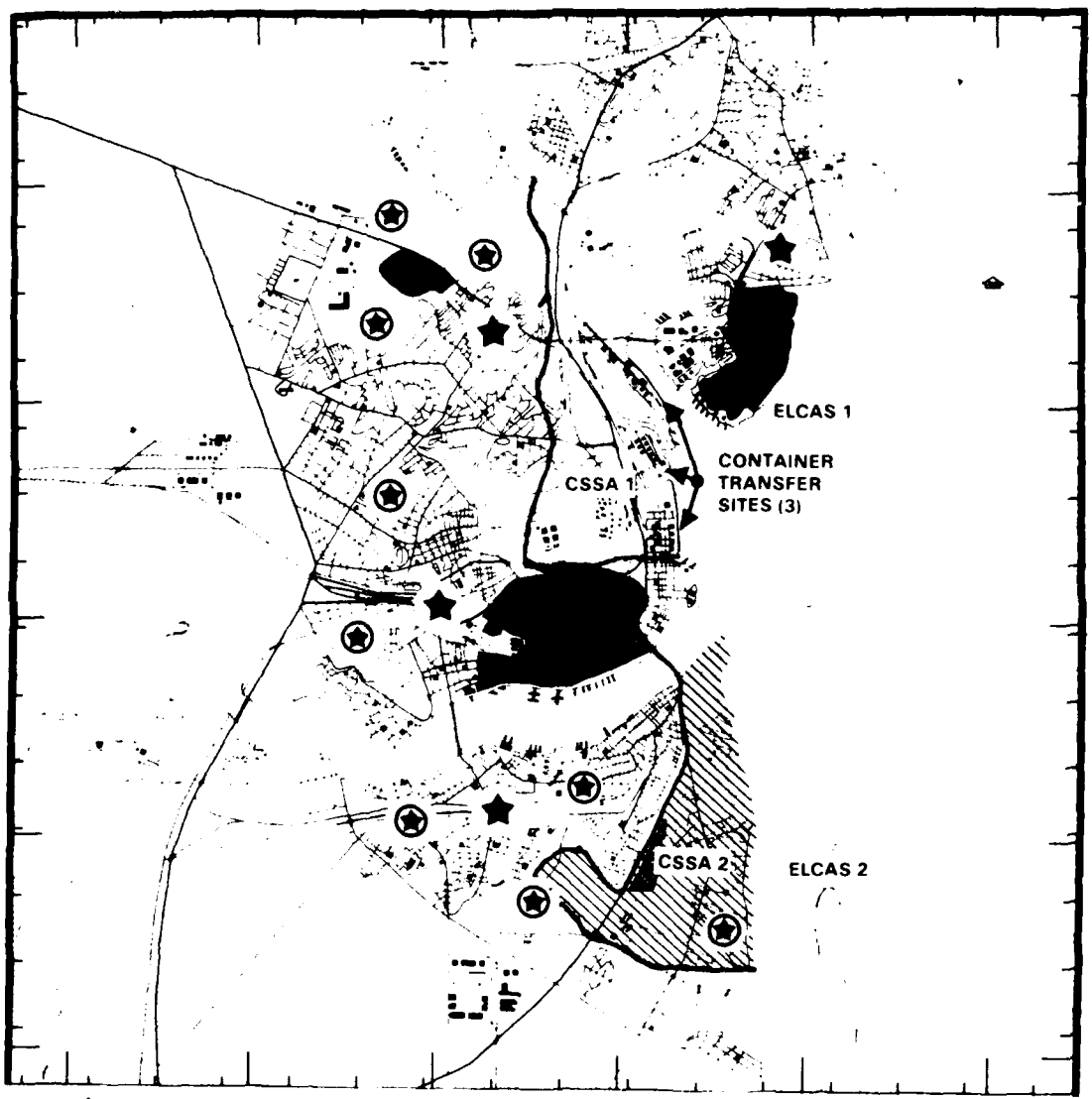


Figure EX-3. Tentative Location of CSS Activities - Defense Inside the City

5.3.2.2 CSS ANALYSIS - DEFENSE

This subsection will summarize the combat service support requirements generated by a MAF-level defense of an urban environment (SYN City). These requirements are peculiar to the SYN City infrastructure, defensive concept selected (Defense Inside the City), and the extent of CSS and defensive preparations accomplished before the initiation of the deliberate defense mission. In a real-world situation, the general urban infrastructure and many aspects of resource availability would be familiar to VII MAF planners by D+11 after the Landing Force had conducted extensive operations within the urban area. The study team endeavored to examine the offense-to-defense transition as well as subsequent "steady-state" defensive requirements using a set of logical assumptions concerning the effects of previous combat operations without and within the city and the combat support activities during initial defensive preparations.

a. Engineer CSS during the SYN City defense is keyed on maintaining lines of communication, providing essential utility services, and assisting with the conversion of selected structures for tactical and logistic purposes. Horizontal and vertical new construction (excepting defensive positions) requirements are minimal as many necessary facilities seized during the offense are suitable for use during the defense. The Naval Construction Reigment (NCR) is tasked with maintaining two airfields and the port complex as well as assisting with the preparation of defensive positions. Engineer combat support requirements peak during the transition from an offensive to a defensive posture with the installation of extensive inner-city obstacles and barriers. The defensive preparations necessary before the Aggressor arrival at the FEBA (3 to 5 days depending on viability of GOP MCATFs) required the use of all available engineer personnel to assist infantry units with the development of strongpoints and the deployment of mines and other obstacles. NCR assets should be withdrawn from SYN City if airfields become untenable and it is determined that other engineering requirements are within the capabilities of engineering units normally organic to the MAF.

b. Civil Affairs Support - Long-term defensive operations within an urban area require the full range of civil affairs involvement to coordinate the management of the indigenous populace so that combat objectives are achieved with minimum civil interference and humanitarian considerations are fulfilled. Augmentation requirements (see paragraph 7.2.2 following) noted for the offensive phase remain valid and two additional functional teams, Public Welfare and Civil Defense, are considered essential during defensive operations. While select teams and the CAG nucleus will be embarked with the AE, the majority of civil affairs augmentation should be embarked with the AFOE and scheduled for early landing within that echelon. Additional civilians must be evacuated from the FDA to ensure their safety and preclude interference with combat operations. The locations of food distribution points require reevaluation once evacuations have been completed.

c. Military Police Support - Military police requirements are further increased during defensive operations when additional civilians must be relocated from the Forward Defense Area (all defensive missions within the city). A moderate hostility factor in the indigenous populace will necessitate the continual supervision of DPRE relocation areas. The preferred option is to use additional MP Guard Companies to act as a force multiplier supervising infantry personnel in controlling the DPRE. The formation of a composite MP Bn may be warranted to promote the most efficient use of MP resources. Civilian personnel who must move throughout the city to accomplish essential support and safety tasks require identification, registration, and ID control. (See Figure A-7)

d. Supply Support - A minimum of 20 DOS of all supply classes well-dispersed at appropriate locations throughout the city is considered essential for continued supply support during intense defensive operations. Support for GOP MCSSDs will be accomplished by long-haul and V/STOL assets until these elements are compelled to withdraw inside the FEBA. The normal complement of supply specialists organic to a MAF is considered to be marginally adequate to handle the supervision and dispersion of supplies through four echelons of stockage.

e. Transportation - Transport requirements during an urban defense are highly dependent upon the manner in which defensive forces are deployed and resupplied. Transport resources organic to the Truck Co Mar Div and the MT Bn FSSG will be fully required during the build-up phase when 4 DOS of supplies are landed, marshalled, and dispersed each day. Thereafter, transport requirements to accomplish daily replenishment are well within the capabilities of transport units. Current transport resources are capable of operating within the urban environment provided that operators are trained for close-quarters maneuvering. The Transport Co (MT Bn FSSG) should be reequipped for optimal handling of 20' ISO containers.

f. Landing Support - Landing support operations during an urban defense involve the structuring of HSTs to support GOP forces and the stevadoring operations in the main port complex. By D+10, when VII MAF received the mission to organize a deliberate defense of SYN City, the LFSP Group had been dissolved and all landing support ashore was under the auspices of CG FSSG. The Navy Cargo Handling and Port Group (NAVCHAPGRU) is responsible for the manning of ships' hatches and elevated causeways, while the Beach and Port Operations Company, supplemented by other Landing Support Bn assets, is tasked to receive and offload cargo at the CSSA interfaces with the port and/or elevated causeways. Personnel-manning requirements supporting the offloading and marshalling of AFOE and resupply containerized cargos are not substantially different in an urban environment vice conventional environment.

g. Nontactical Communications - The establishment of a relatively static defense within an urban environment will permit increased reliance on wire communications to alleviate the problems caused by radio

communications degradation. Additional WD-1/TT and coaxial antenna cable should be embarked, although suitable indigenous materials may be available. The indigenous communications system will be used solely for civil affairs liaison purposes.

h. Maintenance - The provision of intermediate-level maintenance services during an urban defense is keyed to the establishment of ISPs and the deployment of maintenance contact teams from the ISPs. Indigenous structures will be used whenever possible to provide shelter for maintenance operations. The aggregate capability of the Maintenance Bn FSSG is judged adequate for handling the required workload provided that the battalion can simultaneously deploy task-organized maintenance elements at each ISP plus larger, more capable elements at each of the CSSAs. Maintenance elements at each ISP should be capable of assisting with the salvage and/or recovery of damaged equipment, providing contact team support, and providing limited 3rd echelon services. The dispersion of maintenance capabilities is essential during an urban defense.

i. Graves Registration - The problem of temporary interment is accentuated during an urban defense where even fewer land areas meet suggested requirements for that interment. Further, once any significant portion of the ATF departs the AOA, the identification capabilities of the Graves Registration (GR) Plt will not keep pace with the number of deceased in a moderate-to-heavy casualty situation (especially in a temperate climatic zone during the summer season); this identification capability must be increased. Identified deceased will be evacuated by shuttle to theater mortuary facilities for final processing.

j. Combat Service Support Training - Other than those CSS training deficiencies noted during the analysis of urban offensive operations, no additional deficiencies were found to be peculiar to an urban defense. (By the time that the SYN City offense has been completed, most of the CSS deficiencies will have been discovered (the hard way) and corrective actions will have been implemented).

k. Legal Support - Legal support augmentation requirments calculated for long-term offensive operations (> 15 days) will be adequate to handle the increased civil claims and military crime anticipated during an urban defense. These augmentation teams will be staged at the theater support facility and deployed into the FBH as the need arises. The War Crimes Investigation and Courts Martial teams will be attached to the MAF SJA section while the International Law/Claims Teams are organic to the 4th CAG.

l. Embarkation - Embarkation requirements during the SYN City defense center about the movement of resupplies to SYN City and the retrograde of wounded, KIA, and irreparable material from SYN City. No problem areas were noted provided that a minimum of 1 LSD or LPD and 2 CH-53D helicopters are available on a daily basis to evacuate wounded and equipment to the theater support facility (Air MEDEVAC not utilized due to assumed untenability of airfields and the significant threat posed by Aggressor air).

m. Materials Handling Support - The decentralization of CSS activities coupled with the unit distribution of supplies required all MHE assets organic to the division and FSSG to accomplish the handling of 4 DOS/day during the buildup of supplies ashore between D+11 and D+15. Productivity factors for this equipment were based on an 80% overall availability, operations during darkness and/or inclement weather and the possibility of degraded operations due to the wearing of chemical protective clothing. All current MHE items are expected to satisfactorily interface with the urban environment. Procurement and fielding of some type of rough terrain container handler is recommended ASAP to reduce reliance on ad hoc measures for handling large containers. These container handlers should be evaluated with respect to embarkation compatibility and operations within confined areas.

n. Medical Support - The crucial medical consideration during the SYN City defense is the number of CRTSs remaining in the AOA. The redeployment of the bulk of the ATF (TF 51) left a total of 11 operating rooms and 558 definitive care beds available for casualty treatment. The combined ATF and Medical Bn capability is still insufficient to handle the projected casualty level resulting from a moderate-to-intense urban defense. Additional hospital companies or an 1,800 bed hospital ship must be provided on-station no later than D+10. Medical units established ashore will benefit from the utilization of indigenous structures for medical purposes.

o. Functions with LOW Urban Impact (Defense) - The following CSS functions are not significantly affected by defensive operations in an urban environment. These functions will continue to be performed in basically the same manner as in any other relatively static defensive situation. Personnel should be provided with basic indoctrination concerning urban combat.

Financial Management	Ecclesiastical Services
ADPS	Embarkation
Food Service	Landing Support
Administration	Dental Support
Postal Service	

p. Functions NOT PROVIDED During SYN City Defense - The following CSS functions would not be provided during the initial deliberate defense in any environment. (These functions could be provided during the occupation phase of the operation after Aggressor forces within the GOPL had been eliminated).

Exchange Services	Band (Primary mission)
Special Service Clubs	

5.4 INDIGENOUS RESOURCES

One of the prominent differences between combat in an urban area and combat in a more conventional environment is the potential availability of indigenous resources that would further tactical and logistic efforts of the Landing Force/VII MAF. This subsection will note the resources, both natural and man-made, typically available in an urban area, military and civilian requirements for these resources, and priority utilization considerations when conflicting requirements arise for the use of a single resource or facility.

5.4.1 INDIGENOUS RESOURCE AVAILABILITY/REQUIREMENTS

5.4.1.1 Both natural and man-made resources are available in the urban environment. The natural resources often influence the pattern and progress of urban development; lakes, swamps, and rivers often divide a city into functional areas by precluding further development. Man-made resources include those facilities, structures, equipment, and communications that have evolved to meet the needs of the populace and provide shelter and livelihood to the inhabitants. While much information concerning resource utilization can be gleaned from aerial photography, all-source intelligence must be exploited. Data concerning underground railways and other subterranean features that cannot be acquired through technical/library sources prior to an operation may have to be gleaned by physical reconnaissance.

5.4.1.2 Military requirements for natural resources located within a city follow patterns similar to natural resource utilization in a conventional environment. The natural resources may be used to provide mobility, countermobility, survivability, and general engineering support to the Landing Force. Water is essential for many combat service support tasks. Much information concerning the civilian utilization of natural resources can be provided by repetitive multi-spectral photographic coverage; in-country reconnaissance will refine and supplement resource utilization analyses prepared prior to the operation.

5.4.1.3 The abundance of closely spaced man-made features over a wide area provides military forces with myriad opportunities not available in a conventional environment. While most of the indigenous facilities and LOCs have been developed and optimized for a select purpose (i.e., port, airfield, bridge), many urban structures can be used for multiple purposes (i.e., tactical and logistic) depending on their construction and location. Functioning utilities will reduce the LF engineering burden as well as provide for public health and welfare. The cooperation (albeit reluctant) of key civilians is essential to provide continued utility support, public health and safety, and semi-autonomous control of the populace until a military government is established by the occupying force, or combat operations move out of the city. Figure EX-4 opposite provides a graphic summary of resource utilization in the SYN City scenario. (See Figure A-8)

RESOURCE	RESOURCE UTILIZATION: MILITARY REQUIREMENT: MOBILITY	COUNTERMOBILITY	SURVIVABILITY	GENERAL ENGINEERING	CMD CONTROL COMMUNICATIONS	SUPPLY	MAINTENANCE	PUBLIC SAFETY	PUBLIC HEALTH	PUBLIC INFORMATION	NO IDENTIFIED REQMT	MANAGEMENT BY VII MAF*: CA MANAGEMENT	GCE MANAGEMENT	ACE MANAGEMENT	CSSE MANAGEMENT
NATURAL	1 2 4 6 8	3 6 7 8	3	3 6 8		2 3 4 8	4	6 8	1 5 6 8			1	2 3 6 7		4
FACILITIES	3 6			5		1 3	4 5	2						6	1 2 3 4 5
STRUCTURES			**		1 3 5 6	1 4	1	2 3	4 7	3	8	ALL			
UTILITIES AND COMMUNICATIONS				1.2. 3.4	5.6. 7.8			1.5	1.2. 3.4	7.8		ALL			
LOCs	ALL														1.2 3
EQUIPMENT	2.4	4	5	4		1.2	3	5	2			5		3	1.2. 4
SUPPLIES	1.3	1	1	1		1.3			2.4			2.4			1.3
HUMAN				2	1.3			3.4	2	1.5		ALL			

*GENERAL MANAGEMENT RESPONSIBILITY NOTED SHOULD BE REEVALUATED ON A CASE-BY-CASE BASIS ONCE ASSAULT UNITS HAVE LANDED

**AS REQUIRED. STRUCTURE TYPES WILL VARY

NATURAL	1. Farms 2. Fields 3. Woods 4. Surfaced Areas 5. Interment sites 6. Lakes (Ponds) 7. Swamps 8. Rivers	EQUIPMENT	1. MHE 2. Motor Transport 3. GSE (Aviation 4. Engineer 5. Public Safety	STRUCTURES	1. Administrative 2. Schools 3. Police & Fire Stations 4. Stores/Shopping Centers 5. Private Dwellings 6. Hotels/Apartments 7. Medical 8. Churches & Museums
FACILITIES	1. Port 2. Prison 3. Bulk Fuel Complex 4. Naval Station 5. Industrial Areas 6. Airfields	SUPPLIES	1. Construction 2. Subsistence 3. Fuel 4. Medical	UTILITIES & COMMUNICATIONS	1. Water Treatment 2. Electric Power 3. Waste Treatment 4. Sanitary Disposal 5. Police & Fire Comm. 6. Telephone 7. Radio & Television 8. Newspapers
LOCs	1. Roads 2. Bridges 3. Railroads	HUMAN	1. Civil Government 2. Utility 3. Public Safety 4. Equipment Operators 5. General Populace		

Figure EX-4. VII MAF Utilization of Indigenous Resources

5.4 INDIGENOUS RESOURCES (CONTINUED)

5.4.2 INDIGENOUS RESOURCE UTILIZATION PRIORITIES

The conduct of combat operations within an urban area may be facilitated by the prioritized assignment of selected indigenous resources to cognizant units or activities. Each urban area must be evaluated on a case-by-case basis to ascertain which indigenous resources are mission-critical or required for multiple purposes. The key is to evaluate the resource with respect to category, location, and overall military potential.

5.4.2.1 The proper management of indigenous resources becomes most critical during an urban defense when a maximum number of units and activities are deployed within the metropolitan area. During the amphibious assault and initial offensive operations, relatively few CSS organizations have been landed and most resources will be used for combat or combat support purposes. The assignment and/or management of structures, equipment, and supplies will often be on an ad hoc basis during initial urban offensive operations.

5.4.2.2 Land areas and structures will present the greatest management problems during an urban defense. The assignment and eventual use of these resources depends upon whether they are physically located within the Forward Defense Area (FDA) adjacent to the FEBA, or CSS areas/facilities generally rear of the FDA. The urban infrastructure may even preclude certain combat or logistic operations in selected areas, e.g., shanty towns or other areas with extensive flimsy wood-frame construction are not suitable for the development of hardened defensive positions or the storage of flammable supplies.

5.4.2.3 The utilization of land and structures within the FDA is not homogeneous. The most forward slice of this area will be used for obstacles and primary strongpoint positions covering those obstacles with direct fires. Rearward of the area containing initial obstacles and primary strongpoints will be land and structures required for a mix of combat, combat support, and combat service support functions with assignment priorities generally as listed. Many land areas and structures can be utilized for multiple purposes, i.e., on-position supplies stocked next to defensive strongpoints. At the rear of the FDA a greater variety of CSS is accomplished and resource allocation would tend to stress the satsifaction of accompanying CSS requirements on a comparable priority with combat and combat support requirements. In most cases within the FDA, land areas and structures will be allocated for countermobility/survivability, supply/maintenance, and other activities in that order.

5.4.2.4 While the resource utilization emphasis in the FDA focused on the establishment and continued support of countermobility and survivability operations, the emphasis in CSS areas centers on utilizing available indigenous resources to enhance or complement combat service support efforts. Requirements at these CSS areas for extensive barriers or strongpoint positions are generally not as extensive as in the FDA; available

land areas and structures are in greater demand for supply storage, maintenance operations, and DPRE/POW/CI confinement. Not all land and structures in the CSS areas can be totally converted for military use; some of these resources will be required to provide subsistence or welfare support to the populace.

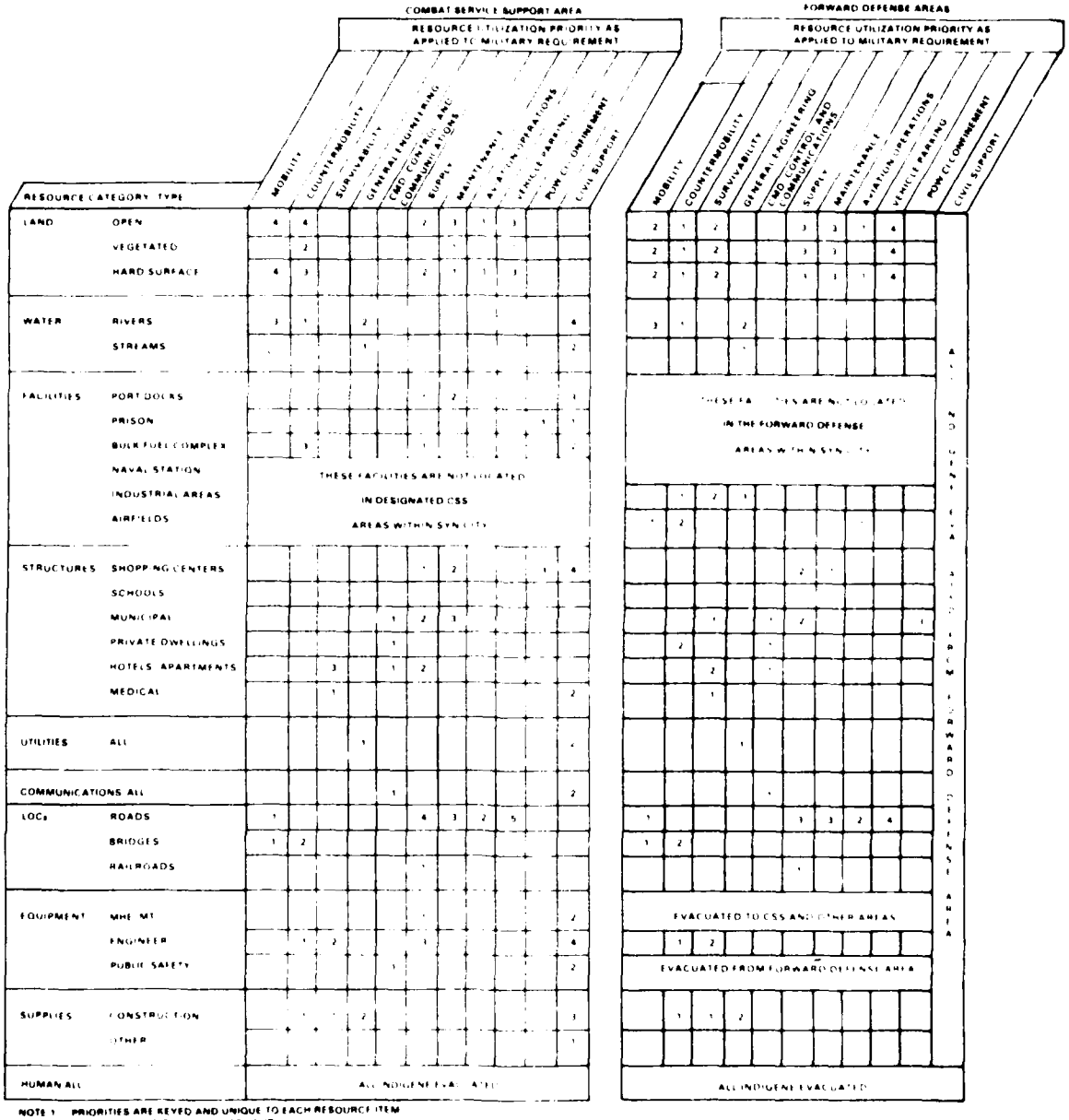


Figure EX-5. Indigenous Resource Utilization Priorities in Forward Defense and Combat Service Support Areas

5.5 LOGISTIC PLANNING FACTORS AND USAGE RATES

The development of urban logistic planning factors and usage rates for all supply classes proved to be an extremely difficult task dependent upon many separate assumptions concerning force structure, combat operations, combat support activities, and the nature of SYN City itself. These planning factors, therefore, are sensitized to the requirements and peculiarities of Operation BREAKER and would require refinement if additional threat, terrain, resource, or ethnological information was available. The methods used to derive the SYN City logistic planning factors included a combination of numerical and Delphi analyses aimed at modifying or validating existing planning factors applicable to an "average" environment and combat intensity. It should be noted that both the SYN City offensive and defensive phases included MCATF operations of up to two reinforced battalions in a conventional environment; neither of these two phases was totally urban-unique. In fact, most urban operations are expected to include some form of MCATF operations as a means to expand and consolidate the Force Beachhead Line (offense), or to defend against and delay the enemy advance within the MAF Security Zone (defense).

5.5.1 Class I - The Class I planning factors were derived using ration mixes specified in MCO P4400.39D and the number of personnel within the FBH. Weight and cube information for the different types of rations was taken from NAVMC 1017 (TAM). The overall Class I planning factor from D-day through D+40 averaged to 4.69 lb/man/day vice the current factor of 7.05 lb/man/day. The variance is due to the time period over which the factor is calculated and the unsuitability of the "A" ration for initial combat operations.

5.5.2 Class II - Class II Combat Active Replacement Factors (CARFs) were estimated for selected secondary equipment items for both offensive and defensive phases of the SYN City operation. Existing CARFs given in TAM #6 were evaluated using a Delphi technique by a group of technical analysts familiar with the SYN City environment, USMC tactical and logistic operations, and urban combat. The scope of the contract precluded the derivation of a set of consolidated Class II planning factors; rather, equipment items with a greater urban applicability (or lack of) were identified by the CARF evaluation process. Items with a greater usefulness and replacement requirement in the urban environment include: (See Figures A-9, A-10)

- Body armor
- Individual wpns & MGs
- Gas and water cans
- WD-1/TT, coax
- Engineer demolition equipment
- Night vision equipment
- Hoisting equipment, manila rope
- Chemical detection kits

Pilferage of Class II items will be a problem in the urban environment. Many of these items have utility in the civilian community, especially during the disruption of normal economic processes caused by combat operations.

5.5.3 Class III - The consumption of Class III products is significantly affected by urban combat. Ground fuel usage during both offensive and defensive phases was modeled for 23 equipment categories of fuel consumers. The model was based on displacement for combat vehicles and hours of operation for stationary equipment. The model also compared SYN City modeled fuels with fuels calculated using TAM fuel usage factors. The overall model provided the opportunity to closely examine ground fuel requirements resulting from a phased deployment of assets into the FBH, MCATF operations in a conventional environment outside SYN City, and urban-only defensive operations occurring in an area of less than 100 sq km.

The ground fuel model provided total required fuel quantities (MOGAS, DF-2) per combat period as well as the ratio of SYN City-modeled to TAM-calculated fuels, given the same level of equipment assets. It was found that the TAM methodology overstated the anticipated fuel requirement for all urban operations, except those involving MCATFs. The fuel ratios between SYN City (SC) and TAM (NAVMC 1017) methodologies are provided below.

	MOGAS SC/TAM	DF-2 SC/TAM
Offense (D-day through D+10)	.50	.72
Defense (D+11 through D+40)	.56	.66

Consumption of aviation fuel during the course of any tactical operation is influenced by the types and number of aircraft employed, the sortie rate for each type aircraft, and the munitions load and flight profile during each sortie. Utilization patterns for 7th MAW assets during both offensive and defensive phases generally paralleled their employment during similar operations in conventional terrain. The principal determinant of Class III(A) consumption was found to be the basing scheme and introduction of aircraft into the FBH. Fly-in echelons were based at theater airbases during periods when suitable landing sites were unavailable in SYN City. Consumption data contained in the MAGTF Lift Validation and MCDEC Logistic Planning Data volumes was used to estimate consumption for each aircraft type. Of the total daily Class III(A) consumption of approximately 680,000 gallons, consumption in SYN City varied from 500,000 gpd (Period V) to 123,000 gpd during Period VII when Airfields 1 and 2 have become untenable.

5.5.4 Class IV - Requirements for construction-type materials were derived for both phases of the SYN City operation. The calculations included barrier requirements outside the city as well as those inside the city. Over 90 percent of the total Class IV tonnage was composed of AM-2 matting used to upgrade airfield surfaces. The exclusion of the AM-2 tonnage reduced the overall Class IV planning factor to a level comparable to the current factor of 2.152 lb/man/day. The current MAF mount-out of Class IV items was considered adequate to support an urban operation provided that Rapid Runway Repair components and wire rope are embarked in sufficient quantities.

The Class IV analysis was based on data contained within the SYN City Data Base and would be refined if additional data were available through the analysis of pre-operation imagery, reports of in-country agents, and actual reconnaissance once the operations were underway. A quantification of indigenous Class IV items is desirable since they will be used whenever available to supplement embarked supplies. (See Figures A-11, A-12)

5.5.5 Class V - The consumption of ammunition items is based on many interrelated factors. Threat, terrain, organic weapons, ammunition availability, intensity of conflict, and scheme of maneuver all have a direct influence on expenditures for various weapons systems. The nature of the urban area will determine weapons effectiveness and those weapons utilized to destroy the enemy. Urban areas are generally characterized by internal areas containing relatively dense populations and in most cases multistory building structures. Line-of-sight restrictions in almost any urban area will dictate which weapons are effective and will accomplish the mission without producing unnecessary casualties to the indigenous population. Long-range indirect fire weapons and surface-to-surface guided missiles with long arming distances in comparison to total flight distance will not be effective and will be used less than man-portable weapons with high short-range kill probabilities. Vehicular weapons systems are canalized by urban infrastructures to such an extent that they provide lucrative targets for portable antitank weapons before they have a chance to provide fire support for friendly troops. The most effective weapons in urban combat involving intense close-quarters small-unit actions are individual small arms, machineguns, flame weapons, breaching weapons, and light mortars.

5.5.5.1 Class V(W) expenditures during the amphibious assault and consolidation of SYN City were calculated based on the combat actions occurring in representative mini-scenarios developed for the SYN City offense. The mini-scenarios, and combinations thereof, provided a tool by which to compare urban expenditures with the total Class V(W) mount-out as given in the most recent run of the MAGTF Lift Model. (MCATF expenditures were not included in this analysis.) This methodology revealed potential deficiencies in the normal MAF mount-out as well as other items not in current inventories that would prove useful during an urban offense. (See Figures A-13, A-14)

Items with potential mount-out deficiencies include:

- 7.62 4/1 Linked
- Mines
- Fuse PD CP
- SMAW-type
- M34 WP Grenades
- Concussion Grenades
- 105mm HEP(T)
- Ceiling/Wall Breacher

The expenditure of Class V(A) items during the SYN City offense was influenced to a greater degree by the basing of aircraft than by the presence of an urban environment. The phasing of aviation ashore, within the SYN City metropolitan boundary, was predicated upon the availability of suitable landing surfaces, rearm and refuel capabilities, and the expansion of the consolidated area within the FBHL. The vast majority of combat missions were directed against targets located in conventional terrain outside the city. Utility and logistic missions within the city required Class V(A) support levels and items also similar to those in a conventional environment. These considerations prompted the use of Class V(A) consumption data contained in the MAGTF Lift Validation vice development of planning factors from detailed operational analyses. The daily Class V(A) requirement varied from 131 short tons (Period II) to 390 short tons during Period V after the arrival of Fly-In Echelon #1.

5.5.5.2 Defensive Class V(W) requirements were analyzed for each period of the SYN City defense in order to better quantify the urban-only requirement (i.e. eliminate the MCATF influence which was not urban-unique). Many of the mini-scenarios developed for the SYN City offense were still valid for the initial period of defensive action in which the only threat inside the city was posed by irregular forces conducting sniping and sapper attacks against selected MAF facilities and activities. Class V(W) expenditures for this period were expressed as a percentage of the average daily SYN City Class V rate calculated for the periods of offensive action. The percentage rate varied by weapon but generally was on the order of 10-15 percent. MCATF expenditures reflect conventional firing rates applicable to a delaying action in the MAF Security Zone outside SYN City.

The actual urban-only defense, occurring after Aggressor forces have reached the FEBA, will be decided in the Forward Defense Area immediately to the rear of the FEBA. The development of defensive mini-scenarios comparable in detail to those developed during the offensive analysis was attempted but found cost-ineffective (within the limitations of this contract) due to the size of forces being modeled, the level of urban detail necessary to structure the model, and the wide variability of Class V expenditures in different tactical and geographic situations. Lacking the analytical resources to complete such a task, analysts chose to apply a standard Delphi technique to baseline expenditure data established for the defense of a position (contained in Table 7-6 of FM 101-10-1 w/Ch 1). A group of technical analysts familiar with the SYN City defensive scenarios, USMC tactical and logistic operations, and urban combat established expenditure factors in relation to the baseline data. The results of the Delphi analysis reflect the increased utility of weapons and ammunition items with short-range effectiveness. Weapons and ammunition items with a higher than normal usage during an inner-city defense are expected to include: (See Figures A-15, A-16)

- Fuze PD CP
- DRAGON
- LAW
- Mortars (HE)
- Hand Grenades
- Mines
- Machineguns
- Rifles
- M203
- SMAW-type
- Demolitions

Class V(A) requirements during SYN City defense operations were also based on conventional planning factors since the majority of expenditures were directed against Aggressor elements advancing toward the city. The utility of high-performance aircraft within dense urban areas is marginal due to the presence of widely varying building heights and the difficulty of accurately placing munitions loads. V/STOL aircraft are more effective weapons platforms in these areas, but these aircraft are extremely vulnerable to man-portable air defense weapons sited within the upper floors of tall buildings. As was the case with Class III(A) requirements, the overall Class V(A) requirement was determined by the aircraft basing scheme and the availability of suitable landing surfaces within the city. The SYN City daily requirement (excluding assets based at theater facilities) varied from 220 short tons (Period VI) to 108 short tons during Period VII when selected V/STOL assets only are based within the city.

5.5 LOGISTIC PLANNING FACTORS AND USAGE RATES (CONTINUED)

5.5.6 Class VI - Initial Class VI support will be provided by the Ration Supplement Sundries Pack (TAM S0060) until such time as AAFES supprt becomes available. The sundries pack contains tobacco products, personal hygiene items, stationery, and other general supplies. The individual share of the sundries pack is .41 lb/man/day. When AFFES support becomes available, the current planning factors and inventory mixes should be adequate in an urban environment provided that civilian clothing is eliminated from the support package. Although many Class VI items would be locally available in an urban area, economic intercourse will be restricted to MAF-level procurement of construction supplies.

5.5.7 Class VII - Major equipment item CARFs were estimated using the same methodology employed for Class II items. High-usage items during the urban defense included:

- Armored vehicles
- ATGM systems
- Mortars
- Decontamination apparatus
- Seismic intrusion devices
- Night vision equipment

(See Figures A-17, A-18)

5.5.8 Class VIII - Medical supplies and equipment, configured into AMAL/ADAL blocks, were found to be adequate in aggregate to treat casualties occurring in the FBH through D+52. The overall depletion rate of the Class VIII mount-out averaged 1.895 percent per day if each casualty required an equal amount of medical consumables. Although combat in an urban environment may slightly alter the composition or mix of injuries, urban casualties are much the same as nonurban casualties. No new medical procedures or associated supplies need be developed to treat urban casualties. The current Class VIII planning factor of 1.53 lb/man/day is considered valid for urban combat scenarios involving a moderate-to-heavy casualty rate.

5.5.9 Class IX - Class IX requirements are probably the most difficult consumable requirements to estimate due to the large number of individual Class IX items, the lack of urban combat experience with these items, and continuing modernization and improvement programs involving major end items. Many equipment items are largely maintained by civilian vendors and repair parts requirements have not been captured in USMC data bases. Other items are nearing the end of their useful service life and are not being repaired when found unservicable. Many items of engineer and motor transport equipment are in this category and repairs are not cost-effective beyond a certain point. Replacement items have not been in service long enough to accumulate historical demand data.

The table below provides urban Class IX planning factors derived by the Delphi process.

		URBAN	
SUBCLASS	CURRENT	OFFENSE	DEFENSE
IX (A)	.200	.190	.067
(B)	.260	.257	.325
(D)	.010	.001	.001
(G)	.090	.150	.120
(K)	.780	.710	.663
(L)	.020	.150	.013
(M)	.520	.560	.598
(N)	.010	.006	.008
(T)	.010	.009	.013
	1.900	2.033	1.808

5.5.10 Class X - A major objective during the amphibious assault into SYN City was the isolation of that area from Aggressor combat units and external resupply. By isolating SYN City, VII MAF is bound by principles of international law and humanitarian considerations to provide a subsistence level of support to those elements of the populace denied external (Aggressor-originated) resupplies. Subsistence food requirements necessary to support a population of 250,000 were estimated at approximately 1 lb/man/day or 128 short tons of food per day, once indigenous stocks have been depleted. It was also recommended that two emergency drug kits and one equipment kit be assembled and staged at the theater support facility in the event that indigenous Class VIII supplies are prematurely depleted.

5.6 THE MID-RANGE INFLUENCE

The basic concepts for providing combat service support in an urban environment, as discussed in previous sections, are expected to remain valid during the mid-range period. Influencing factors include those concerned with friendly equipment introductions and/or deletions, improved Aggressor capabilities, changes in the SYN City infrastructure or ethnological characteristics of the populace, and changes in the force structure of a notional MAF. While the basic CSS concepts remain essentially the same as in the current time frame, many of the current supply planning factors will require modification due to the influences noted above.

5.6.1 The most important mid-range influences are those concerned with anticipated MAF force structure changes and the introduction of new equipment items. The new generation of armored vehicles (M1 MBT, LAV, MPGS) will have the greatest impact in the CSS functional areas of engineering (bulk fuel), embarkation, supply (Class IX), and maintenance. Other items which are essentially one-for-one replacements (such as the CH-53E, AV-8B, F/A-18, M198, VIPER, STINGER) are generally expected to decrease maintenance requirements as compared with the items they replaced. The full implementation of the Amphibious Logistics System (ALS) will have a significant impact in the functional areas of engineering and embarkation. The overall urban impact of equipment changes with respect to each CSS functional area is difficult to quantify until detailed impact analyses of these items or systems have been finalized for operations in conventional environments. *(See Figure A-19)*

5.6.2 Aggressor capabilities during the mid-range period are expected to increase in the areas of NBC warfare, armored operations, radio-electronic combat, and air defense. These increased capabilities will require that friendly forces be provided with more capable chemical protective equipment, armor penetrators, communications equipment, and electronic countermeasures (ECM) equipment. Current developmental efforts are directed to these ends and neither force should have a decided advantage during this period.

5.6.3 The SYN City infrastructure is expected to develop further by the mid-range period. This development is normal for expanding metropolitan areas and would include aspects of LOC upgrading, urban renewal, expansion of the metropolitan boundary, and an enhancement of the port complex and throughput capabilities. Although the actual metropolitan area may be slightly larger in the mid-range, internal development efforts will accrue to the advantage of friendly forces. The population itself is expected to grow, necessitating the provision of additional subsistence supplies. The hostility factor should remain relatively unchanged unless a serious schism develops between the two countries.

5.7 NBC WARFARE IMPLICATIONS

The NBC and directed energy environments were considered during the development of tactical schemes of maneuver, combat service support concepts, and logistic planning factors. Paramount was the requirement to analyze CSS capabilities and requirements in a representative urban environment. Given the facts that the Aggressor has used NBC warfare in past conflicts and that Aggressor doctrine stresses the use of NBC weapons to achieve tactical objectives, the next step in the NBC analysis was to determine typical Aggressor use of NBC weapons in a representative urban environment.

5.7.1 Convincing arguments can be made for and against the wide-scale Aggressor use of weapons of mass destruction in the SYN City scenario. Arguments for the use of these weapons include existing Aggressor doctrine, tactical opportunities and imperatives, and political and morale effects resulting from a decisive (albiet costly) victory in SYN City. On the other hand, SYN City is within the Aggressor homeland and thousands of innocent civilians would become casualties if these weapons or agents were directed within the city. Additionally, nuclear warfare within the confines of SYN City would leave key facilities and areas unusable; the creation of extensive rubbling would actually aid the defending force.

5.7.2 While data concerning Soviet use of NBC warfare within urban environments is limited, DIA Report DDI-1100-155-77, Soviet Military Operations in Built Up Areas, suggests that "it is unlikely that nuclear weapons will be used against areas of a city which are to be fought over by Soviet ground troops. Their resulting extensive destruction and contamination would only hinder the progress of operations. Where strategic/political circumstances permit, the Soviets might be expected to consider using nonpersistent chemical weapons (because of their potential for human destruction without causing material damage)." Analysts concluded that the most likely use of nuclear weapons would be against MCATFs operating within the MAF Security Zone. Nonpersistent chemical agents would be directed against localized areas and key facilities within the city.

5.7.3 Considering the weapon utilization patterns suggested above, the principal CSS impact of NBC weapons use in an urban environment is the creation of acute medical overloads. The magnitude of the CW medical workload in a heavy-casualty MAF-level scenario is presented in detail in the Medical and Dental Support System Study. Although this study utilized MARCORPS I forces within a conventional environment, the relative level of casualties is considered indicative of the CW workload in an urban environment. The study recommends provisional measures and augmentation teams necessary under such circumstances; this medical support structure is equally necessary in the SYN City scenario.

5.7.4 Secondary CSS impacts of NBC warfare in an urban environment will be felt in all CSS functional areas. These impacts involve reduced productivity due to the wearing of chemical protective clothing, increased civil control problems, and contamination of supply stocks, storage areas, and organizational equipment. All CSS analyses considered secondary impacts from the limited use of CW agents within the city. Productivity factors have been modified where necessary and chemical-related supply planning factors have been increased accordingly.

5.8 SYNTHETIC CITY TECHNICAL DATA BASE EVALUATION

5.8.1 The SYN City Technical Data Base was evaluated during the course of Phase I (Offense) of this study effort (Volume I Chapter VIII) and found to be an adequate technological base from which to address many logistic concepts and systems. Phase II (Defense) is a logical continuation of Phase I and many aspects of the previous evaluation were still applicable. The data base generally contains more information than necessary for the preparation of MAF-level operation plans. Data provided in many categories far exceeded that normally available for contingency planning. Contingency planning data, on the other hand, may also provide additional and/or refined data not extant in the technological base. In either cas, the type and level of information available will influence many aspects of detailed tactical and support planning.

5.8.2 The figure opposite summaries utilization of the SYN City Technical Data Base during the study effort and notes other data that would expand the usefulness of existing data base. All categories of data were utilized to some extent; most categories provided data both sufficient for detailed analyses and in excess of that normally contained in contingency data packages. Data noted as lacking in several categories might be available prior to the operation, while other data would not be available until after consolidation of the urban area. It is recommended that those additional data types noted as desirable be considered for future development and incorporation into the technical data base.

5.8.2.1 The most notable data shortfalls, from the standpoint of detailed tactical and logistic analyses, can be grouped into three categories:

- Natural Features - Trafficability parameters, microrelief;
- Man-Made Features - Bulding types, density, construction materials; and
- Ethnological Features - Socio-Political tendencies, hostility factor.

The data base does not contain trafficability data for most areas within the MAF tactical area of responsibility, with the exception of two mountain ranges and an extensive swamp. Additional data in the form of individual overlays for vegetation (type, size, canopy closure), microrelief, and soil type for a composite trafficability overlay) would facilitate the selection of Aggressor approach routes and the estimation of Security Zone barrier requirements. The technical data base adequately delineates urban, surburban, and industrial areas within the city but provides little additional information concerning the type or spacial arrangement of structures. Defensive organizations and deployments as well as Class V expenditures are significantly influenced by the military usefulness of the urban terrain (structures and intervening open areas) that must be defended. The final type of desirable data, and potentially most critical to the overall

operation, concerns the anticipated actions by the indigenous populace in response to the MAF presence. Military police and civil affairs augmentation requirements could become unmanageable with fanatical popular opposition; internal security requirements would militate in favor of minimizing the MAF presence inside the city by selecting appropriate offensive or defensive concepts (Seize A Corridor/Defense Outside the City).

5.8.3 It is recommended that the data shortfalls noted above be resolved by the development of supplemental data either in a generalized format or directly from contingency data packages. This data will materially enhance the usefulness of the technological base. Other desirable data is not as crucial in terms of the overall analysis, but is necessary to complete the data base and allow for fully integrated and detailed combat, combat support, and combat service support planning. The utility of the model lies in its versatility--major additions or changes to the existing data can be made on a case-by-case basis.

DATA ELEMENT	DATA UTILIZED	NECESSARY DATA PRESENT	ADDITIONAL DATA DESIRABLE	TYPE DATA DESIRABLE*
I.A. Open Space-Steep Slope				Not Evaluated
I.B. Open Space-Shallow Slope	X		X	Vegetation/Trafficability Data
II.A.-G. Environment	X	X		
III.A. Util/Comm-Garbage	X		X	Equipment Data
III.B. Util/Comm-Sewerage	X	X	X	Engineering Data
III.C. Util/Comm-Storm Water Disposal	X	X	X	Engineering Data
III.D. Util/Comm-Potable Water	X		X	Storage Capacities and Well Production Data
III.E. Util/Comm-Electric	X	X	X	Standby Generating Capacity
III.F. Util/Comm-Telephone	X	X		
III.G. Util/Comm-Radio/Television	X	X		
III.H. Util/Comm-Minor Radio	X	X		
IV.A. Transportation-General	X	X	X	Vegetation/Trafficability Data
IV.B. Trans-Surface Networks	X	X	X	Additional Road and Bridge Data
IV.C. Trans-Water Routes	X	X	X	More Detailed Hydro Data
IV.D. Trans-Rail Routes	X		X	Equipment Data
IV.E. Trans-Air	X	X	X	Additional Facilities Data
V.A.-D. Medical	X	X	X	Level of Supply Stocks
VI.A. Resources-Local Transportation	X		X	Additional Equipment Data
VI.B. Resources-Construction	X		X	Material Type and Quantity Data
VI.C. Resources-Industry	X	X		
VI.D. Resources-Foods	X		X	Farming and Food Stockage Data
VI.E. Resources-Fuels	X	X	X	Tank Capacity Data
VI.F. Resources-Public Buildings	X	X	X	Quantity of Firefighting Equipment
VI.G. Resources-Open Areas, Buildings	X		X	Structural Density and Construction Data
VI.H. Resources-People	X		X	Ethnological Data

* SEE ALSO VOL I CHAPTER VIII

Figure EX-6. Summary of Data Base Utilization, Presentation, and Completion

6. CONCLUSIONS

These conclusions are provided relative to the logistic considerations and combat service support analysis presented in Section 5.3 of this volume. Each conclusion refers to the applicable subparagraph in Section 5.3. Recommendations are provided in Section 7.

6.1 OFFENSIVE CSS - CONCEPT

6.1.1 Combat service support of the amphibious assault is not substantially different in an urban environment. Floating dumps, prepositioned supplies, and helicopter delivery of emergency supplies are required support mechanisms until BSAs are established. (5.3.1.1)

6.1.2 The development of urban CSS activities subsequent to the amphibious assault is keyed to the follow-on mission (attack or defend) assigned to the Landing Force. (5.3.1.1)

6.1.3 The location of BSAs, HLZs, and CSSAs will be determined by the physical layout of the urban area as it impacts on the scheme of maneuver dictated by the assigned mission. Each urban area must be analyzed on a case-by-case basis to ascertain the optimum locations for CSS activities. (5.3.1.1)

6.1.4 Detailed pre-operation intelligence is vital to the task-organization of CSS elements as well as combat units. (5.3.1.2) CSS commanders must articulate EEI early-on to focus the intelligence gathering effort.

6.2 OFFENSIVE CSS - FUNCTIONAL AREAS

6.2.1 Engineer CSS requirements peak four to seven days after the amphibious assault. The Engr Supt Bn FSSG is judged capable of providing resources necessary to establish BSAs and CSSAs as long as these resources have been identified and embarked in the AE. Early rehabilitation of airfields and port facilities is beyond the initial engineer capabilities normally organic to a MAF. The overall engineering requirements during an urban offense are such that effective coordination between all engineer-oriented elements is essential. (5.3.1.2a)

6.2.2 The ethnological characteristics of the indigenous populace will influence the level of civil affairs support necessary to accomplish the Landing Force mission in an urban setting. The civil affairs capability of a notional MAF is totally inadequate to provide this interface; augmentation is essential. Pre-operation intelligence should provide guidance concerning the level of augmentation. Civil affairs planning should provide for a smooth transition to the support required during the worst-case follow-on mission, since policies and procedures followed during the offensive will influence civil compliance during the follow-on mission. The 4th CAG (USMCR) is capable of providing the nucleus for a larger civil

affairs element; USAR civil affairs specialty teams include the billet descriptions that would be needed to fill out the 4th CAG for major urban warfare operations. Conversely, the Marine Corps and Navy can identify many of the necessary skills in their reserves.

6.2.3 Prolonged urban operations will require military police support in excess of organic MAF capabilities. An increased incidence of military crime, as well as the supervision of civilian evacuation and relocation, will require that MP augmentation elements be embarked with the AE and AFOE. The coordination between MP units would be facilitated by the establishment of a composite MP Battalion.

6.2.4 Indigenous structures will be extremely valuable for storing selected supply stocks. Indigenous supplies with military construction or civilian subsistence applicability will reduce the supply burden on the Landing Force. A Urban PWRM Project Stock is essential to ensure the availability of selected supply items found to be urban-unique or required in greater quantities than normally embarked. (5.3.1.2d)

6.2.5 MAF transportation capabilities are adequate to provide support in an urban environment. Ad hoc measures will be necessary to transport large containers until container-compatible transport equipment is fielded. Lightweight applique armor and shatter-proof windshields are warranted to provide operator protection in a close-quarters environment. (5.3.1.2c)

6.2.6 Normal landing support concepts and operations were not altered in the SYN City scenario. LF assets were adequate for task-organizing the required level of landing support. Topographic and hydrographic conditions at the land/water interface are generally more critical with respect to landing support operations than is the city infrastructure. (5.3.1.2f)

6.2.7 Nontactical radio communications degradation will force ad hoc measures until effective landline communications can be established. (5.3.1.2g)

6.2.8 Maintenance support during an urban offense is not substantially different from that in a conventional environment. Maintenance efforts will be facilitated by the availability of suitable indigenous structures. (5.3.1.2h)

6.2.9 Suitable areas for temporary interment may not be available in a densely populated urban area. (5.3.1.2i)

6.2.10 Identified combat service support training deficiencies do not jeopardize adequate CSS, but will require additional training efforts in the areas of urban camouflage, motor transport operation in a constricted environment, structural suitability for CSS activities, vehicular hardening, evacuee and refugee control, and civil affairs support. (5.3.1.2j)

6. CONCLUSIONS (CONTINUED)

6.2.11 The increased workload in an urban environment will require that additional legal specialists be identified and earmarked for delivery into the AOA if long-term (> 15 days) operations are contemplated. (5.3.1.2k)

6.2.12 Cube capacity of AE shipping may not be adequate to embark a notional MAF AE. Using USMC studies for ships available, the shortfall was 300,000 CF. (5.3.1.21)

6.2.13 Current MHE assets organic to a MAF are not optimally compatible with containerized cargo handling operations. Ad hoc measures are necessary in the current time period to handle 20' and larger ISO containers.

6.2.14 The combined ATF and Medical Bn FSSG casualty treatment capability is not adequate if and when more than one primary CRTS is redeployed from the AOA. The normal echelonment of medical elements into the FBH will provide adequate medical support during the initial stages of an urban amphibious assault. Indigenous structures will provide shelter for medical elements. (5.3.1.2n)

6.3 DEFENSIVE CSS - CONCEPT

6.3.1 The CSS concept for deliberate urban defensive operations must provide for the dispersion of combat service support assets and capabilities. A logical and progressive development of the offensive CSS posture is possible if the defensive mission is anticipated early-on and CSS elements are directed into a CSS posture favoring both assault support and transition to defensive support. The CSS dispersion can be accomplished by establishing an Intermediate Support Point (ISP) in each regimental sector of responsibility. Selected supply stocks are required in company and battalion rear areas, as well as at ISPs and CSSAs. (5.3.2.1)

6.3.2 The defensive CSS concept must take into consideration the combat requirements and scheme of maneuver for whatever type of defense is selected. Locations for forward supply stocks and ISPs are influenced by the Aggressor capability to penetrate the FEBA. (5.3.2.1)

6.4 DEFENSIVE CSS - FUNCTIONAL AREAS

6.4.1 The most crucial engineer CSS requirement during defensive operations will be to provide technical (combat) engineering advice and supervision to divisional elements. NCR augmentation elements will be necessary as long as the airfields are tenable. Engineer priorities at this point in time are combat support oriented until all required barriers and obstacles have been emplaced. (5.3.2.2a)

6.4.2 Adequate civil affairs support is even more essential during urban defensive operations. Additional augmentation teams for Public Welfare and Civil Defense are advisable to ensure that the local government implements appropriate measures to provide for the public welfare during

periods of intense action. Relocation of food distribution points may be necessary as will the evacuation of all civilians remaining near the FEBA. (5.3.2.2b)

6.4.3 Supervision of DPRE during defensive operations would normally require even more military police assets than are recommended in Section 7.5. The most viable option to accomplish this supervision is to use one MP Guard Company plus additional replacement draft personnel to establish monitoring teams for each DPRE relocation site. (5.3.2.2c)

6.4.4 Supply support must be decentralized during urban defensive operations. Supply specialists are required at each of the ISPs and CSSAs; the Supply Bn FSSG contains adequate personnel to supervise decentralized supply operations provided that unit supply specialists maintain accountability of forward stocks. A minimum of 20 DOS of all supply classes should be stocked ashore and dispersed at designated locations throughout the city. Indigenous structures will be used to the maximum extent possible to store sensitive supplies. (5.3.2.2d)

6.4.5 The Transport Co MT Bn FSSG is not optimally configured to transport large ISO containers loaded to maximum weight. (5.3.2.2e)

6.4.6 The establishment of relatively static defensive positions within the city will permit an increased reliance on wire communications. (5.3.2.2g)

6.4.7 Maintenance support must be decentralized during defensive operations. Contact teams, based at ISPs, will bear a greater responsibility for forward intermediate-level maintenance operations. The Maintenance Bn FSSG is judged marginally capable of the required degree of decentralization. (5.3.2.2h)

6.4.8 The graves registration workload exceeds the capabilities of the GR Plt under its current organizational structure. The basic concept for care of the dead remains the same as during offensive operations (identification in FBH, evacuation to theater mortuary). (5.3.2.2i)

6.4.9 Legal support augmentation recommended for long-term offensive operations will be adequate in a defensive situation. (5.3.2.2k)

6.4.10 A daily shuttle service between the FBH and the theater facility will be necessary to evacuate wounded and deceased, transport replacements, and retrograde severely damaged equipment. (5.3.2.2l)

6.4.11 The MAF density of MHE is marginally adequate to accomplish a 4 DOS/day supply buildup. Procurement and fielding of rough terrain container handlers will improve the container-handling capability.

6.4.12 A hospital ship with 1,800 bed capacity is considered essential to provide the required level of medical support following the redeployment of primary CRTSs. Medical units ashore will benefit from the availability of structures suitable for medical purposes.

7. RECOMMENDATIONS

These recommendations are provided relative to Sections 5.3 (Logistic Considerations) and 6 (Conclusions) of this volume as well as relevant material presented in Volumes I and III of the overall study effort. Accordingly, it is recommended:

7.1 OFFENSIVE CSS - CONCEPT

7.1.1 That tactical and logistic planners carefully consider the Aggressor reinforcing capability and secondary MAF mission when establishing the initial CSS posture in an urban area. The initial CSS concept should be flexible enough to accommodate either a continuing attack inland or subsequent deliberate defense. (5.3.1.1, 6.1.2)

7.1.2 That probable urban contingency areas be reevaluated in the light of material presented in this study effort. (5.3.1.1, 5.3.1.2, 6.1.3, 6.1.4)

7.2 OFFENSIVE CSS - FUNCTIONAL AREAS

7.2.1 That engineering requirements for rehabilitation of port areas, airfields, and utility systems be identified early-on to quantify the level of engineer augmentation. NCR elements should be embarked with the AFOE and scheduled for early debarkation because early rehabilitation of these facilities is required. DOD expertise should be identified in the area of public utility system inspection and rehabilitation. An informal Engineer Group should be established to ensure liaison between all engineer units landed within the FBH. (5.3.1.2a, 6.2.1)

7.2.2 That any MAF-sized urban operation be supported by a task-organized Civil Affairs Group. In a scenario involving prolonged (i.e., > 15 days) urban operations with a volatile and hostile populace, the composition of the civil affairs element should include the following assets:

- 4th Civil Affairs Group (USMCR)
- Civil Affairs Functional Teams:*
  - IB (Civilian Supply)
  - LB (Food & Agriculture)
  - NB (Property Control)
  - PB (Public Communications)
  - 2 TB (Public Safety)
  - UB (Public Transportation)
  - WB (Public Works & Utilities)
  - Linguists as required

  (5.3.1.2b, 6.2.2)

*comparable to USAR Teams

(See Figure A-20)

7.2.3 That any MAF-level urban operation longer than 15 days in duration be supported by a composite MP Battalion composed of the following assets:

- Composite MP Bn Hq
- MP Co H&S Bn Mar Div
- MP Co H&S Bn FSSG
- 2 MP Guard Companies equivalents (FMF or USAR)
- Minimum 12 additional Criminal Investigators

Command emphasis should be placed on minimizing unauthorized military-civilian contact in an effort to reduce the military crime rate. (5.3.1.2c, 6.2.3)

7.2.4 That indigenous structures suitable for supply storage be identified as soon as possible and provisions made for relocating (if appropriate and depending on availability of handling and transport assets) any indigenous supplies found therein. Indigenous Class IV items and foodstuffs should be located and reported to the cognizant Landing Force element. An Urban PWRM Project Stock, including selected Class II, IV, V, and VII items, should be established to ensure adequate supply support in an urban environment. These items are essentially those which suffer increased loss in urban warfare or those not in the current inventory. (See Figure A-21) (5.3.1.2d, 6.2.4)

7.2.5 That container-compatible transport assets be introduced into the Motor Transport Bn FSSG as soon as possible. Future generations of logistics vehicles should have shatter-proof glass surfaces and the capability to accept lightweight applique armor for operator protection. (5.3.1.2e, 6.2.5)

7.2.6 That future generations of VHF radio equipment be configured to minimize communications degradation in urban environments. The indigenous communications system, if functioning, should be used solely for the liaison between authorized military and civilian entities. (5.3.1.2g, 6.2.7)

7.2.7 That forward-deployed contact teams be utilized to provide initial maintenance support until the remainder of the Maintenance Bn FSSG has been landed. Consolidated sectors should be surveyed for structures suitable for maintenance purposes. (5.3.1.2h, 6.2.8)

7.2.8 That provisions be made for theater mortuary support, daily shuttle service between the FBH and the theater facility, and refrigerated containers suitable for the temporary storage of deceased. (5.3.1.2i, 6.2.9)

7.2.9 That training programs be established at appropriate levels to remedy identified CSS training deficiencies. The most important CSS training topics include urban supply storage expedients, MT/MHE operations in confined areas, and urban communications expedients. (5.3.1.2j, 6.2.10)

(See Figure A-22)

7.2.10 That War Crimes Investigation and Courts Martial augmentation teams be identified and prepared to deploy into the FBH should legal capabilities within the MAF SJA and 4th CAG prove incapable of handling the required workload. (5.3.1.2k, 6.2.11)

7.2.11 That a detailed analysis of embarkation requirements involving eventual urban combat be conducted to ensure that sufficient amphibious shipping is provided to embark the AE and AFOE including appropriate CA and MP augmentation elements and initial civilian emergency relief supplies. (5.3.1.21, 6.2.12)

7.1.12 That MAF MHE inventories be reevaluated in the light of container-handling requirements. Rough Terrain Container Handlers (RTCH) should be procured and fielded as soon as possible. (5.3.1.2m, 6.2.13)

7.2.13 That a hospital ship be assigned to the ATF to provide the required level of medical support in a moderate-intensity combat environment. (5.3.1.2n, 6.2.14)

7.3 DEFENSIVE CSS - CONCEPT

7.3.1 That CSS units be prepared to decentralize their activities and provide support from ISPs and CSSAs. Each CSS unit should analyze its capability to provide support "slices" at four ISPs with the remainder of the unit being deployed within one of the CSSAs. (5.3.2.1, 6.3.1)

7.3.2 That consideration be given to the effect of the defensive mission-type upon the locations of CSS activities. (5.3.2.1, 6.3.2)

7.4 DEFENSIVE CSS - FUNCTIONAL AREAS

7.4.1 That the level of NCR augmentation be evaluated in the light of total engineering capabilities and requirements during a prolonged urban defense. The completion of primary defenses and positions coupled with the possible denial of airifelds by the Aggressor may reduce the requirement for these assets. (5.3.2.2a, 6.4.1)

7.4.2 That FMF/USAR Civil Affairs Functional Teams similar to GB (Civil Defense) and VB (Public Welfare) be identified and prepared to deploy into the FBH as soon as a defensive mission is assigned to the MAF. Civilians should be evacuated from the FEBA and other key sites within the FDA, with food distribution points relocated based on the final distribution of civilians. (5.3.2.2b, 6.4.2)

7.4.3 That elements of a replacement draft be made available for DPRE supervision should augmented MP capabilities prove insufficient. A unit similar to USAR Military Police Functional Team FG should be embarked in the AFOE to handle the increased requirement for processing identification credentials. (5.3.2.2c, 6.4.3)

7.4.4 That selected supply stocks be stored at company and battalion rear areas in addition to those stored at ISPs and CSSAs. Supply detachment commanders at ISPs and CSSAs should make maximum use of suitable indigenous structures. (5.3.2.2d, 6.4.4)

7.4.5 That the assets of the Motor Transport Bn FSSG be reevaluated in the light of containerized operations and container-compatible trailers be fielded as soon as possible. Operators of tractor-trailer combinations should receive additional training in close-quarters maneuvering. (5.3.2.2e, 6.4.5)

7.4.6 That additional communications wire and coaxial cable be embarked with the AFOE to ensure that adequate quantities of these items are available for defensive operations whether or not a deliberate defense is contemplated. Indigenous stocks should be located and utilized. (5.3.2.2g, 6.4.6)

7.4.7 That the Maintenance Bn FSSG evaluate its task organization requirements to support the decentralization required during urban defensive operations. (5.3.2.2h, 6.4.7)

7.4.8 That one dental technician billet should be added to the Graves Registration Platoon headquarters, and one shore party billet in each GR section should be changed to a GR specialist billet. (5.3.2.2i, 6.4.8)

7.4.9 That a minimum of one LPD or LSD and two CH-53D helicopters be allocated (when distances permit) to provide shuttle service between the FBH and the theater facility. (5.3.2.2l, 6.4.10)

APPENDIX A

THIS APPENDIX INCLUDES MATERIAL, DRAWN FROM VOLUME I AND III TECHNICAL REPORTS, PROVIDED AS AN AID TO THE READER WHO MAY NOT BE IN POSSESSION OF THESE DOCUMENTS.

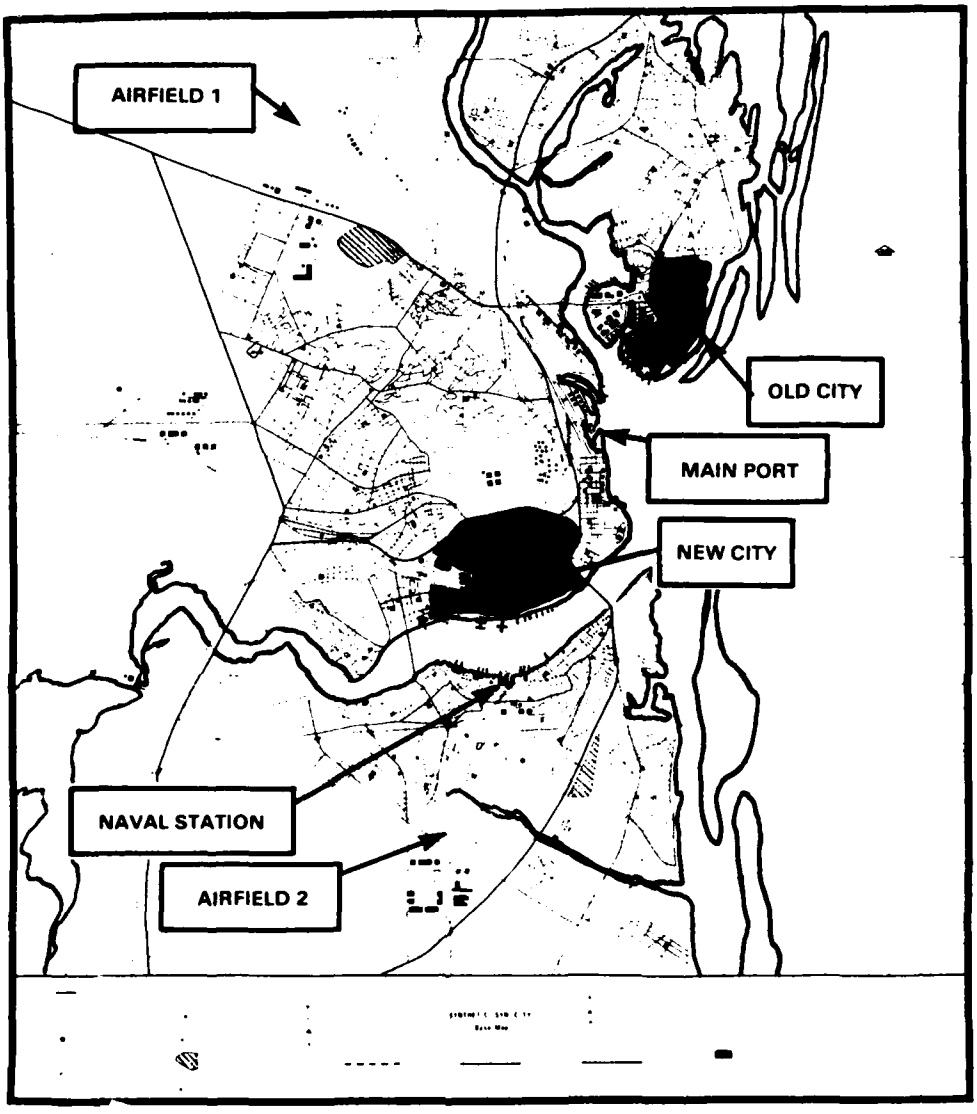


Figure A-1. SYN City Base Map Showing the Metropolitan Area

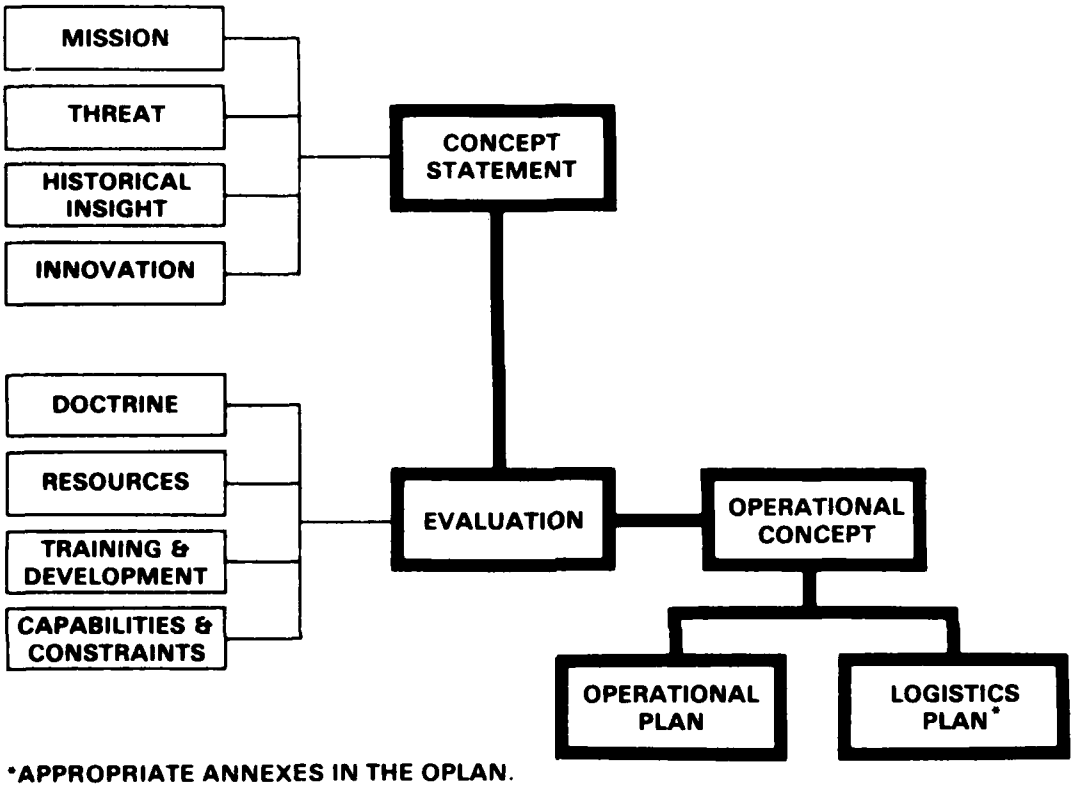


Figure A-2. Developmental Approach to Operational Concepts

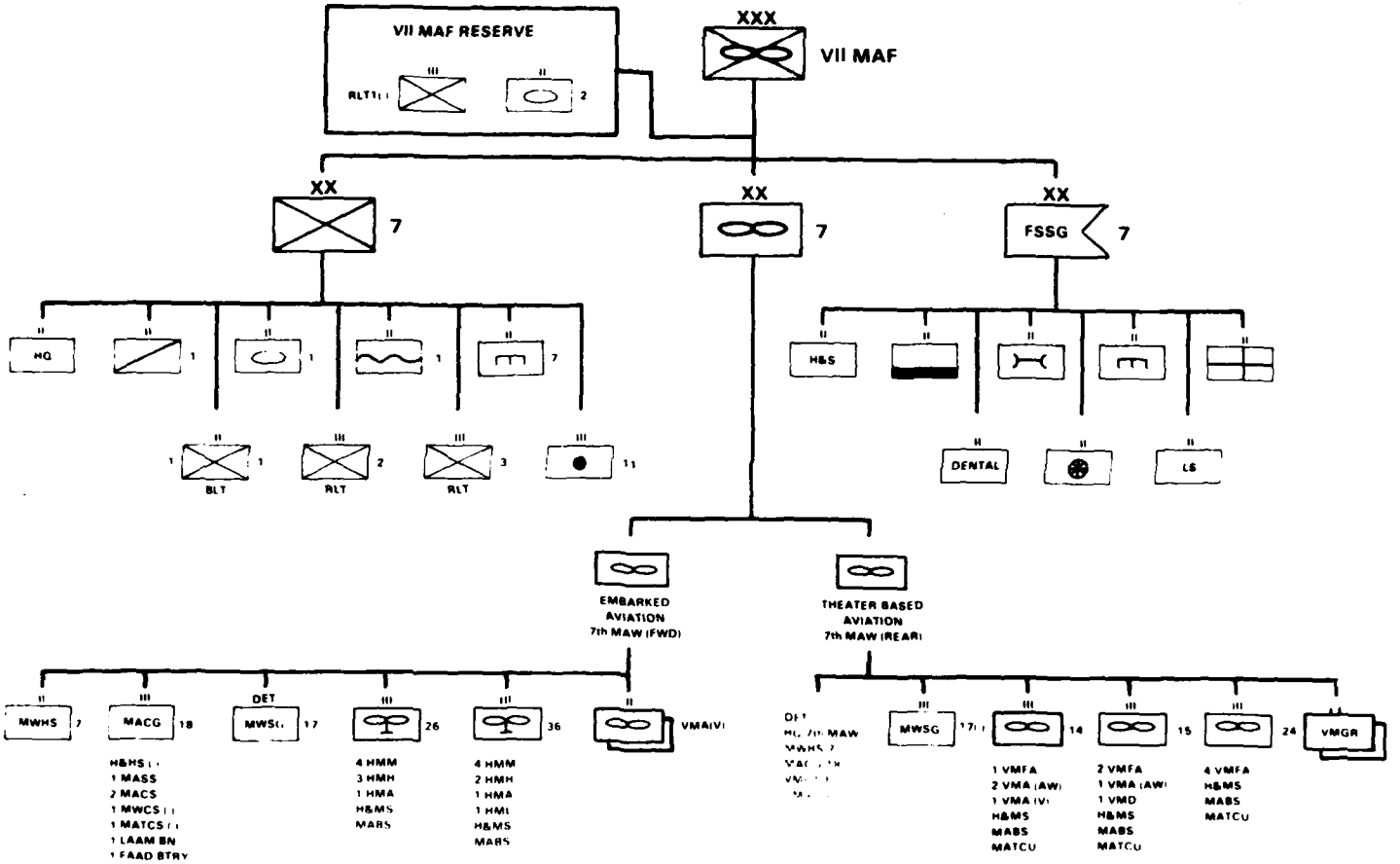


Figure A-3. VII Composite Marine Amphibious Force (VII MAF)

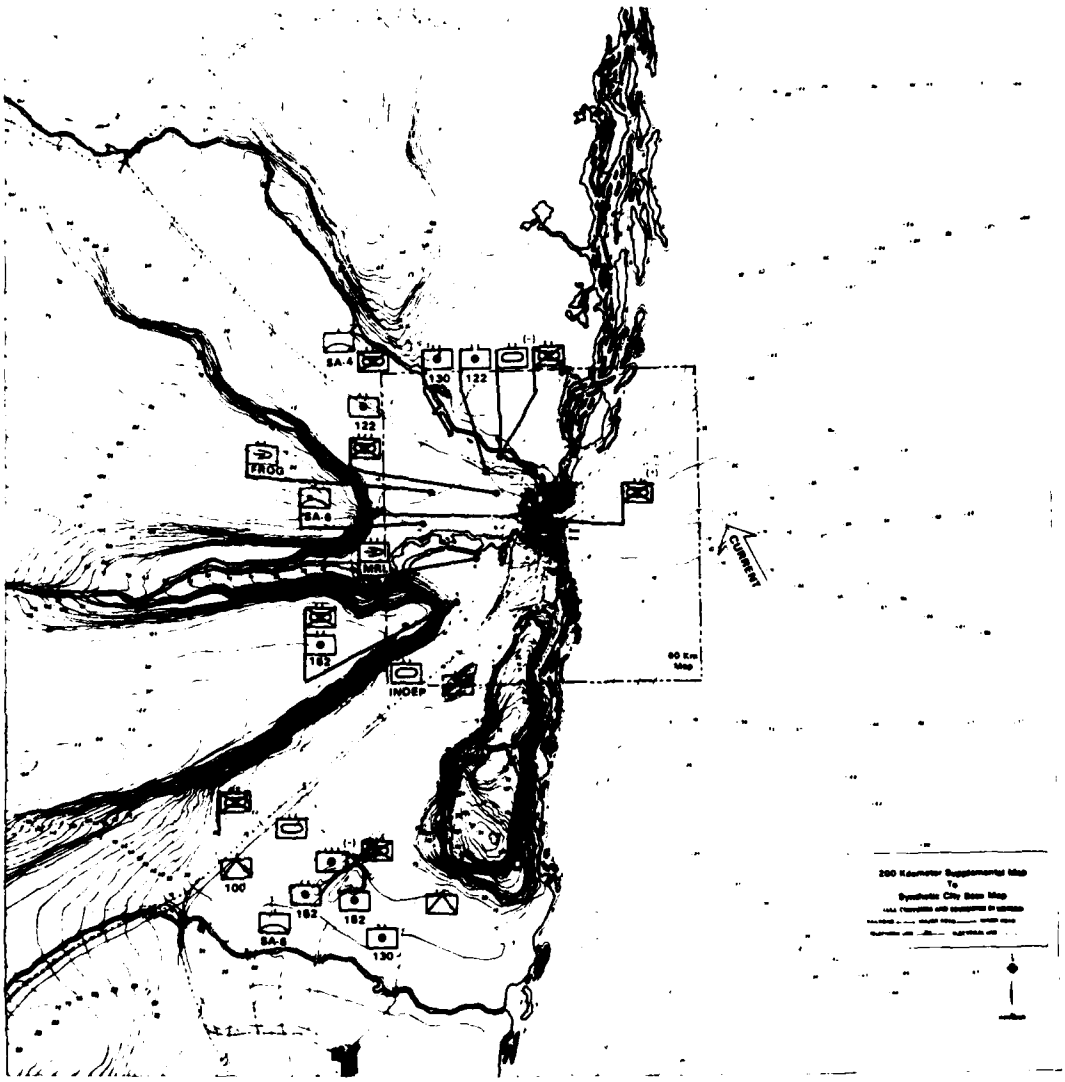


Figure A-4. Initial Aggressor Disposition - Offensive Analysis

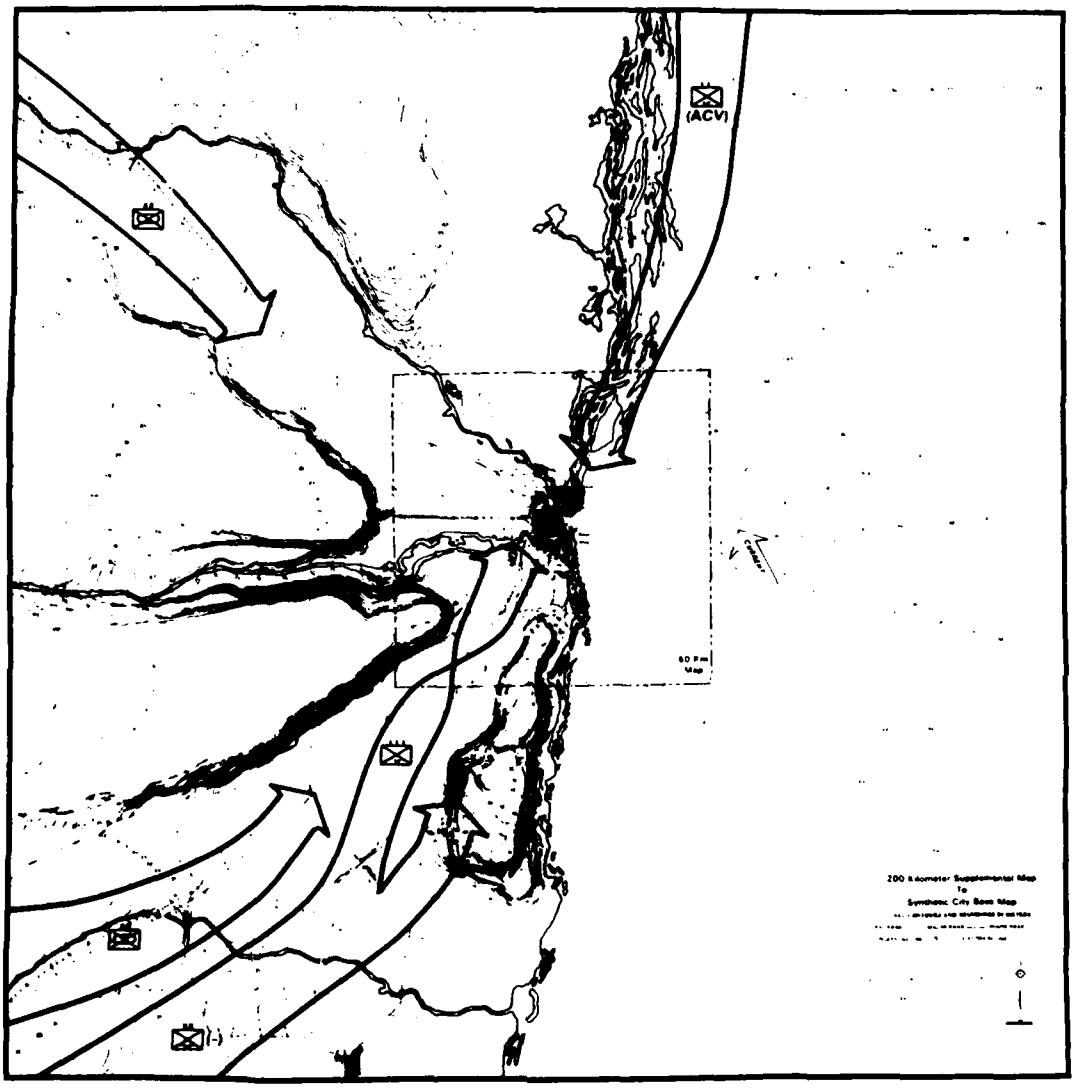
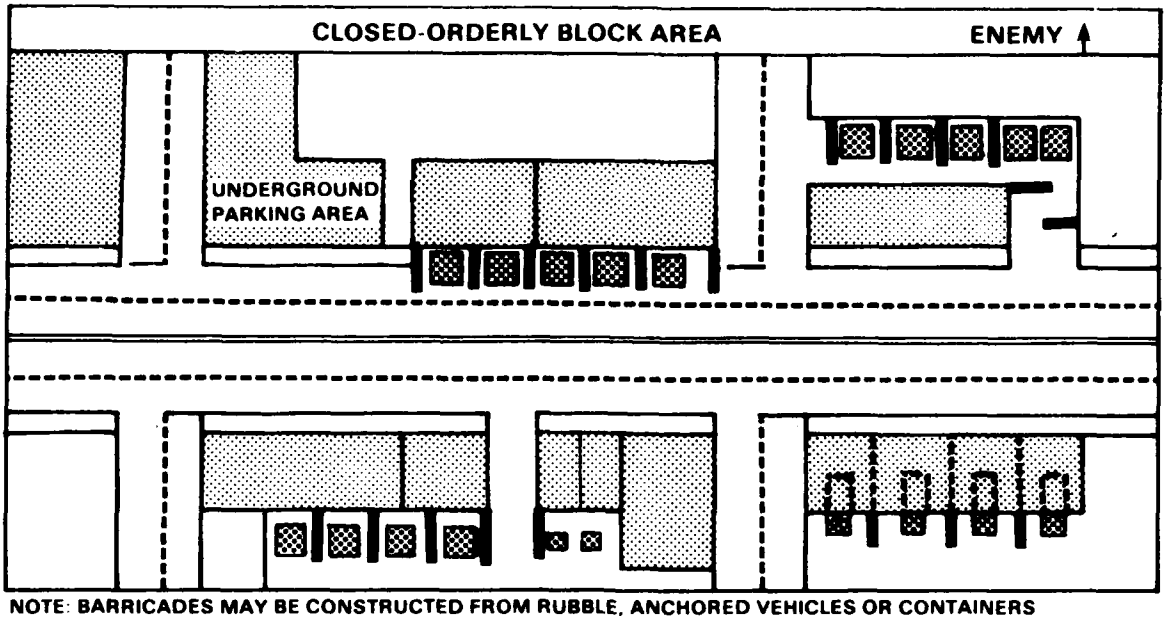
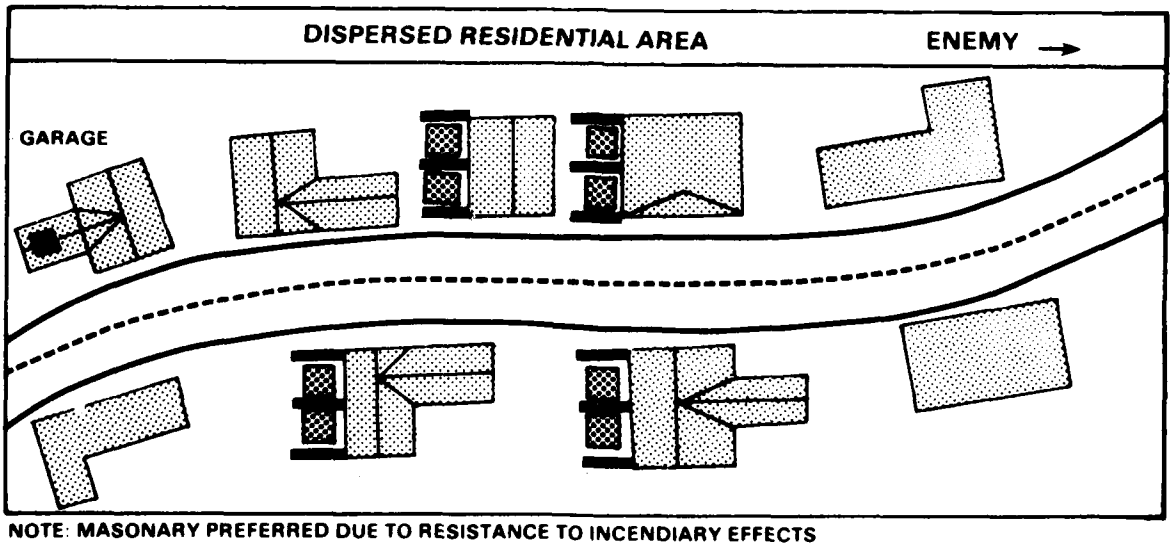


Figure A-5. Aggressor Avenues of Approach - Defensive Analysis





STRUCTURE BARRICADE AMMUNITION

Figure A-6. Modular Class V Storage Expedients in Representative Urban Areas

OPTIONS PREFERENCE	ADVANTAGES	DISADVANTAGES	REQUIREMENTS/REMARKS
1 NO SECURITY FORCE PREFERENCE 6	• DOES NOT DRAW DOWN MAF COMBAT OR SUPPORT UNITS • FOCUSES SECURITY ON MAF INSTALLATIONS	• NO CONTROL OVER DPRE MOVEMENTS/ACTIONS • RISKY IF DPRE ARE UNRULY • ENCOURAGES LOOTING & CIVIL DISORDER • REQUIRES MORE SECURITY AT MAF POSITIONS • DANGEROUS WHEN MAF IS HEAVILY ENGAGED IN DEFENSIVE BATTLES	• REQUIRES THAT CIVILIAN-OCCUPIED AREAS BE CORDONED OFF • REQUIRES EXTREMELY EFFECTIVE CIVIL INFO PROGRAM NOT SUITABLE EXCEPT WITH A COMPLIANT POPULATION
2 LOCAL POLICE PROVIDE SECURITY FORCE PREFERENCE 5	• SAME AS ABOVE • PROVIDES SOME DEGREE OF CONTROL	• ALL OF THE ABOVE BUT TO A SLIGHTLY LESSER DEGREE • NONEXISTENT OR INADEQUATE C²	• REQUIRES CLOSE MAF SUPERVISION OF THIS POLICE FUNCTION • REQUIRES POLICE COOPERATION MARGINALLY SUITABLE IF PEOPLE ARE COOPERATIVE
3 PROVISIONAL MAF SECURITY FORCE (OFF-DUTY, UNDER UTILIZED, AND NOT CURRENTLY ASSIGNED TO KEY TASKS) PREFERENCE 4	• PROVIDES CONTROL OF DPRE • USES AVAILABLE PERSONNEL • PROVIDES SECURITY WITHOUT DRAWING DOWN COMBAT UNITS	• REDUCES CSS EFFICIENCY • LACKS ORGANIC C² • LACKS UNITY OF COMMAND • LESS EFFICIENT THAN USING A T/O UNIT	• REQUIRES THAT WIRE/RADIO COMM BE PROVIDED • REQUIRES COORDINATED SUPPLY SUPPORT FEASIBLE
4 REPLACEMENT DRAFT SECURITY FORCE (USING A DETACHMENT FROM THE DRAFT) PREFERENCE 3	• SAME AS 3 ABOVE • BRINGS SOME REPLACEMENTS IN EARLY • PROVIDES SOME CONTINUITY UNTIL THESE SPECIFIC REPLACEMENTS ARE NEEDED IN COMBAT ROLE	• DIVERTS REPLACEMENTS FROM NORMAL ROLE • LEAVES A SECURITY VOID LATER IF/WHEN REPL ARE REQUIRED • LACKS ORGANIC C² • LACKS UNITY OF COMMAND • LESS EFFICIENT THAN USING A T/O UNIT	• SAME AS ABOVE FEASIBLE
5 RIFLE COMPANIES FROM 7TH MARDIV AS SECURITY FORCE PREFERENCE 7	• PROVIDES EXCELLENT CONTROL SECURITY AT DPRE ASSY AREAS • USES T/O UNIT WITH C² • DOES NOT DRAW DOWN CSS UNITS • FACILITATES SUPERVISION, CONTROL, RESUPPLY	• SERIOUSLY DEGRADES MAF DEFENSIVE CAPABILITY	• REQUIRES A MINIMUM OF ONE BATTALION NORTH OF SOUTH RIVER AND ONE COMPANY SOUTH OF SOUTH RIVER • REQUIRES READINESS TO CEASE SECURITY FUNCTION AND ENGAGE IN DEFENSIVE COMBAT NOT SUITABLE FOR THIS SITUATION
6 OBTAIN EXTRA MP COMPANIES FROM FMF OR ARMY FOR SECURITY FORCE PREFERENCE 2	• ALL OF 5 ABOVE • USES PERSONNEL TRAINED FOR THIS FUNCTION • DOES NOT DRAW DOWN COMBAT UNITS	• NOT LIKELY TO BE AVAILABLE • IF AVAILABLE, TIMELY ARRIVAL DOUBTFUL • PROBABLY NOT FEASIBLE IN LIGHT OF TOTAL USMC COMMITMENTS	• REQUIRES EARLY IDENTIFICATION OF OF THE REQUIREMENT • REQUIRES THE EQUIVALENT OF 7 MP GUARD COMPANIES UNDER BEST-CASE SITUATION GOOD OPTION BUT PROBABLY NOT FEASIBLE
7 OBTAIN ADDITIONAL RIFLE COMPANIES FROM FMF PREFERENCE 1	• PROVIDES EXCELLENT CONTROL SECURITY AT DPRE ASSY AREAS • DOES NOT DRAW DOWN COMBAT OR CSS UNITS • USES T/O UNITS WITH C² • FACILITATES SUPERVISION CONTROL, RESUPPLY • PROVIDES ADDITIONAL COMBAT UNITS AND COMBAT POWER	• AVAILABILITY UNCERTAIN • PROBABLY NOT FEASIBLE IN LIGHT OF TOTAL USMC COMMITMENTS	• REQUIRES THE EQUIVALENT OF A REINFORCED BATTALION • REQUIRES TIMELY ARRIVAL IN AREA EXCELLENT OPTION BUT PROBABLY NOT FEASIBLE

Figure A-7. Security Options for Displaced Persons, Refugees and Evacuees (DPRE)

	BUILDING CHARACTERISTIC	COMMAND & CONTROL	INFANTRY	MECHANIZED (TANK, AAV)	MOTOR TRANSPORT	MAINTENANCE	SUPPLY	MEDICAL & DENTAL	ANTIAIR DEFENSE (LAAM)	REFUGEE & EVACUEE CONTROL	REMARKS
		TYPE MILITARY ELEMENT									
CONSTRUCTION	REINFORCED MASONARY WALLS	X	•	•	X	X	X	X	X	X	BALLISTIC PROTECTION
	ROOF SUPPORTS HEAVY LOADS		X					X			HELO OPERATIONS
	MULTIPLE INGRESS EGRESS POINTS	X	X					X		U	
	LACK OF INGRESS EGRESS POINTS									X	
	BASEMENT AREAS	X						X			
	INGRESS EGRESS FOR MHE, MT EQUIP				X	X	•				
	MULTI STORY CONSTRUCTION	X	X					X	X		
	GROUND FLOOR SUPPORTS HEAVY LOADS			•	X	•	X				
	WIDE STAIRCASES AND OR ELEVATORS							•			MEDEVAC
	LACK OF INTERNAL WALLS					X	X				
	INTERNAL WALLS	X						X			
	HOTEL APARTMENT TYPE CONSTRUCTION	X		U		U	U	X		•	
	MULTI STORY PARKING GARAGES			X		X	X			U	
LOCATION	LOCATED IN OR NEAR LOGISTIC SUPPORT AREAS				X	X	•	X		U	
	SERVICED BY PRIMARY ROAD NET				X		•				
	SERVICED BY RAIL SIDINGS						X			X	
	COMMANDS WIDE FIELD OF FIRE		•	•					X		
UTILITIES	EXTANT UTILITY DISTRIBUTION SYSTEM	X				X		X			
	FIRE CONTROL SYSTEM (SPRINKLERS)	X	X	X	X	X	•	•	X	X	HIGHLY DESIRABLE
	HOIST LIFT EQUIPMENT			X	X	•					
	NEARBY UNDERGROUND FUEL STORAGE TANKS			X	X	X					
	EXTANT COMMUNICATION SYSTEM	X						X		X	CIVILIAN COMMUNICATIONS
	STANDBY GENERATING SYSTEM	X						•			

Figure A-8. Building Characteristics as Related to Military Operations

CLASS II SELECTED ITEMS

NOMENCLATURE	TAMCN[1]	SUBCLASS[2]	TAM CARF[1]		URBAN CARF
			EI	ES	OFFENSE
Armor, body	K4004	E	NL	NL	.1333
Bayonet, M7	E0050	E	.0800	.0400	.0600
Block & tackle set	B0090	T	NL	NL	.1158
Cable, tele, WD-1/TT	H2100	B	.1700	.0850	.2150
CSS, camouflage net	C4261	F	.3321	.1660	.1857
CSS, support system	C4260	F	.3321	.1660	.1857
Can, gasoline, 5G	K4128	E	.0200	.0100	.0330
Can, water, 5G	V4455	E	.2000	.1000	.2100
Clothing, outfit, chem, 1 unit	C2035	F	.0560	.0280	1.3750
Clothing, outfit, chem, ensmbl	C2130	F	4.884	2.442	2.0000
Decon kit, M13	C2065	E	NL[4]	NL	1.000
Demo equip, engr sqd	E0280	E	.0600	.0300	.2430
Demo equip, indiv	E0290	E	NL	NL	.2430
Detector kit, M256	C2101	E	.0660	.3300	.4674
Dispenser, RCA, port, M3	E0320	E	NL	NL	.0345
Flashlight, plastic	K4352	E	NL	NL	.0000
Generator, smoke, M3A3	E0520	E	NL	NL	.0000
Htr, space, 60000 BTU, M1950	V4550	E	.0800	.0400	.0430
Individual clothing, ensemble	Various	F	NL	NL	.7000
Individ clothing, ensemb, cold	Various	F	NL	NL	.7000
Landing boat, inflat, 7-man	C5170	E	.1600	.0800	.0960
Launcher, grenade, M203	E0892	M	.1400	.0700	.1870
MG, 7.62mm, M60	E0990	M	.2350	.1190	.4230
MG, cal .50, M2	E0960	M	.0600	.0300	.1495
Minefield marking set	B1320	E	NL	NL	.0975
Night vision sight, individ	E1158	B	.1647	.0830	.1925
Rifle, 5.56mm, M16A1	E1440	M	.2293	.1025	.2464
Rope, manila, 3/4"	J3215	E	NL	NL	.0787
Shop sets & equipment, various	E1644 thru E1720	B,E	NL	NL	.1755
Shotgun, 12 ga, M870/MK1	E1760	M	.2000	.1000	.4000
Tool kits and sets, various	E2010 thru E3170	B,E,T	NL	NL	.1755

Note 1 - From NAVMC 1017 - TAM Revision #6, 25 Nov 80

2 - Subclass commodity designator, all items Type I material
B - Ground support K - Tactical vehicles E - General Supplies T - Industrial Supplies
G - Electronics M - Weapons F - Clothing & textiles

3 - - CARF not evaluated

Figure A-9. Class II Combat Active Replacement Factors (CARFs) - Urban Offensive Operations

CLASS II SELECTED ITEMS

NOMENCLATURE	TAMCN[1]	SUBCLASS[2]	TAM CARF[1] EI	TAM CARF[1] ES	URBAN CARF DEFENSE MEAN	URBAN CARF DEFENSE STD. DEV.
Armor, body	K4004	E	NL	NL	.150	.0114
Bayonet, M7	E005[illegible]	E	.0800	.0400	.060	.0148
Block & tackle set	B0090	T	NL	NL	.125	.0141
Cable, tele, WD-1/TT	H2100	B	.1700	.0850	.450	.1095
LSS, camouflage net	C4261	F	.3321	.1660	.150	.0307
LSS, support system	C4260	F	.3321	.1660	.150	.0114
Can, gasoline, 5G	K4128	E	.0200	.0100	.045	.0100
Can, water, 5G	V4455	E	.2000	.1000	.250	.0316
Clothing, outfit, chem, 1 unit	C2035	F	.0560	.0280	1.50	.3162
Clothing, outfit, chem, ensmbl	C2130	F	4.884	2.442	2.50	.4879
Decom kit, M13	C2065	E	NL	NL	2.75	.2530
Demo equip, engr sqd	E0280	E	.0600	.0300	.280	.0187
Demo equip, indiv	E0290	E	NL	NL	.280	.0187
Detector kit, M256	C2101	E	.0660	.3300	.500	.0837
Dispenser, RCA, port, M3	E0320	E	NL	NL	.187	.0198
Flashlight, plastic	K4352	E	NL	NL	1.000	.1844
Generator, smoke, M3A3	E0520	E	NL	NL	.040	.0095
Htr, space, 60000 BTU, M1950	V4550	E	.0800	.0400	.060	.0100
Individual clothing, ensemble	Various	F	NL	NL	.700	.0685
Individ clothing, ensemb, cold	Various	F	NL	NL	.450	.0474
Landing boat, inflat, 7-man	C5170	E	.1600	.0800	.055	.0100
Launcher, grenade, M203	E0892	M	.1400	.0700	.220	.0214
MG, 7.62mm, M60	E0990	M	.2350	.1190	.550	.0679
MG, cal .50, M2	E0980	M	.0600	.0300	.260	.0424
Minefield marking set	B1320	E	NL	NL	.080	.0138
Night vision sight, individ	E1158	B	.1847	.0830	.430	.0409
Rifle, 5.56mm, M16A1	E1440	M	.2293	.1025	.260	.02
Rope, manila, 3/4"	J3215	E	NL	NL	1.000	.2739
Shop sets & equipment, various	E1644 thru E1720	B,E	NL	NL	.080	.0084
Shotgun, 12 ga, M870/MK1	E1760	M	.2000	.1000	.400	.0822
Tool kits and sets, various	E2010 thru E3170	B,E,T	NL	NL	.80	.0084

Note 1 - From NAVMC 1017 - TAM Revision #6, 25 Nov 80
2 - Subclass commodity designator, all items Type 1 material
B - Ground support K - Tactical vehicles E - General Supplies T - Industrial Supplies
G - Electronics M - Weapons F - Clothing & textiles
3 - - CARF not evaluated

Figure A-10. Class II Combat Active Replacement Factors (CARFs) - Urban Defensive Operations

TAMCN	ITEM DESCRIPTION	UNIT	PREPARE HARDENED POSITIONS	CONSTRUCT MOBILITY BARRIERS	IMPROVE LANDING SURFACES REPAIR AF DAMAGE	CORRECT DRAINAGE	MODIFY/REPAIR BUILDING STRUCTURES	REPAIR DAMAGE TO LOCs	TOTAL QUANTITY	TOTAL WEIGHT (ST)	REMARKS - SEE BELOW
U3010	BAG, BURLAP	PKG	2538			66			2604	32 56	1
	BARBED WIRE, 400M	REEL		625					625	5 89	1
U3040	GPBTO	CONCER		6780					6780	21 67	1
	MAT SET, AM2	BUNDLE			14848			*	2606	14700	1
U3180	PIPE, CULV, 18"	EACH				144			144	1 66	2
U3190	PIPE, CULV, 36"	EACH				60			60	3 45	2
U3210	POST, FENCE, 32"	EACH	504	421		85			1010	2 53	1
U3220	POST, FENCE, 60"	EACH	1386	11484		170			13040	58 68	1
J3090	LUMBER (2"•4"•10')	EACH	4833	2000		156	⁂	*	6989	62 12	2
	LUMBER (4'•8' PLY)	EACH	891	50			⁂	*	941	40 15	2
J3036	CEMENT, PORTLAND	BAG	*	*							2
J3200	ROOFING FELT	ROLL					⁂				2
	SHEET STEEL ¼"	SHEET	1017						1017	332 22	2
	RAILROAD TRACK	KM		15				*	15	737 03	2
K4720	PLASTIC SHEET	ROLL	126				⁂		126	1 20	1
	STEEL STOCK, L	KM		36					36		2
	SILIKAL	BAG			3000				3000	135	1
								TOTAL		16134	

* ALTERNATE USE, DEPENDS ON QUANTITIES USED TO SATISFY PRIMARY REQUIREMENTS

⁂ SCENARIO DEPENDENT, REQUIRES ADDITIONAL DATA CONCERNING SYN CITY BUILDING CONSTRUCTION; INDIGENOUS MATERIALS WILL BE USED WHENEVER POSSIBLE

1 – ITEMS ARE COMBAT ESSENTIAL AND MAY NOT BE LOCALLY AVAILABLE; MUST BE EMBARKED

2 – ITEMS WILL BE LOCALLY AVAILABLE IN UNKNOWN QUANTITIES. IN-COUNTRY AGENTS AND AERIAL PHOTOGRAPHY WILL BE UTILIZED TO DETERMINE LOCAL AVAILABILITY AND EMBARKATION REQUIREMENTS FOR THOSE MATERIALS

CONSTRUCTION MATERIALS REQUIRED TO SUPPORT OFFENSIVE OPERATIONS IN SYN CITY

Figure A-11. Class IV Requirements - Urban Offensive Operations

TAMCN	ITEM DESCRIPTION	UNIT	PREPARE HARDENED POSITIONS	CONSTRUCT MOBILITY BARRIERS	IMPROVE LANDING SURFACES REPAIR AF DAMAGE	CORRECT DRAINAGE	MODIFY REPAIR BUILDING STRUCTURES	REPAIR DAMAGE TO LOC*	TOTAL QUANTITY	TOTAL WEIGHT (ST)	REMARKS SEE BELOW
U3010	BAG, BURLAP	PKG	9047			●			9047	113.1	1
	BARBED WIRE, 400M	REEL		1201					1201	11.3	1
U3040	GPBTO	CONCER		7260					7260	23.1	1
	MAT SET, AM2	BUNDLE			3425 ●			★	●		1
U3180	PIPE, CULV, 18"	EACH				●			●		2
U3190	PIPE, CULV, 36"	EACH				●			●		2
U3210	POST, FENCE, 32"	EACH		13076		●			13076	32.8	1
U3220	POST, FENCE, 60"	EACH		28457		●			28457	128.1	1
J3090	LUMBER (2"•4"•10')	EACH	●	1000		●	★		1000	8.9	2
	LUMBER (4'•8' PLY)	EACH		250			★		250	10.7	2
J3035	CEMENT, PORTLAND	BAG		★							2
J3200	ROOFING FELT	ROLL					★				2
	SHEET STEEL ¼"	SHEET	●						●		2
	RAILROAD TRACK	KM									2
K4720	PLASTIC SHEET	ROLL					★		●		1
	STEEL STOCK, L	KM							●		2
	SILIKAL	BAG							●		1
J3365	WIRE ROPE ½" DIA	REEL		168					168	20.6	1
								TOTAL		349.6	

* ALTERNATE USE, DEPENDS ON QUANTITIES USED TO SATISFY OTHER REQUIREMENTS

' SCENARIO DEPENDENT, REQUIRES ADDITIONAL DATA CONCERNING SYN CITY BUILDING CONSTRUCTION, INDIGENOUS MATERIALS WILL BE USED WHENEVER POSSIBLE

1 ITEMS ARE COMBAT ESSENTIAL AND MAY NOT BE LOCALLY AVAILABLE, MUST BE EMBARKED

2 ITEMS ARE LOCALLY AVAILABLE, CONTINUING INVENTORIES WILL BE UTILIZED TO DETERMINE LOCAL STOCKAGE LEVELS.

● QUANTITIES LANDED BUT NOT UTILIZED DURING OFFENSIVE PHASE, AVAILABLE FOR DEFENSE OPNS

Figure A-12. Class IV Requirements - Urban Defensive Operations

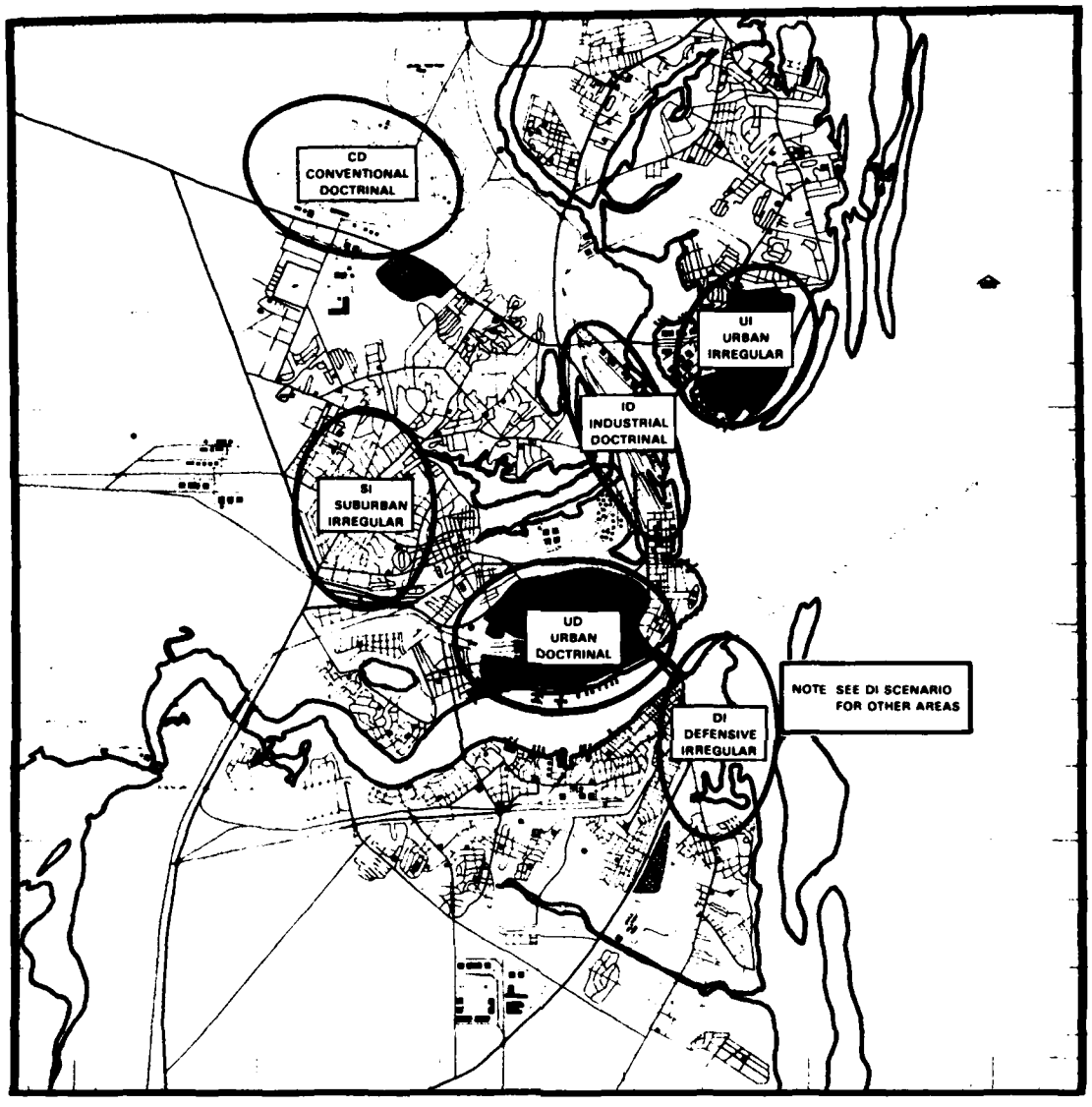


Figure A-13. Representative Areas Selected for Urban Mini-Scenarios (Offensive Operations)

WEAPON	AMMUNITION DODIC	AMMUNITION EXPENDITURES PER SCENARIO TYPE						TOTAL-ALL SCENARIO ACTIONS[1]	% ORG LOAD RQMT[2]	% TOTAL RQMT[3]
		DI	UD	CD	UI	ID	SI			
M16A1	A071 (Ball)	355	29,718	39,600	7,208	16,200	9,540	3,162,282	12.50	5.95
M60	A1318(4&1)	600	20,000	20,000	4,000	11,400	4,500	2,418,900	76.74	30.09
M[illegible]	A576A(4&1)	100	-	-	-	-	-	191,700	16.60	7.37
M65	A589(4&1)	-	9,750	-	-	13,800	-	58,463	9.02	3.83
M203	B546(HE) B567(CS)	6(HE)	540(HE) 18(CS)	144(HE)	-	540(HE)	-	14,211(HE) 32(CS)	12.94 .23	4.42 .07
M19	B627(Illum) B630(WP) B632(HE)	-	46(WP)	24(Illum) 48(WP) 60(HE)	-	576(HE)	12(WP)	24(Illum) 1941(WP) 1788(HE)	.23 39.28 7.16	.07 13.02 1.99
M29A2	C226(Illum) C276(WP) C256(HE)	-	34(HE)	16(Illum) 32(WP) 40(HE)	-	68(WP)	-	16(Illum) 236(WP) 100(HE)	.16 3.50 .20	.04 .96 .05
M60A1	C508(HEAT) C521(ADPS)	-	11(HEAT) 17(APDS)	-	-	28(HEAT) 11(APDS)	-	104(HEAT) 63(APDS)	.70 .48	.26 .16
M101A1	C445(HE) C477(WP C468(CS)	-	-	-	-	932(HE) 74(WP) 68(CS)	-	2796(HE) 222(WP) 204(CS)	NL[3]	NL[3]
M109A1	D544(HE)	-	9(HE)	-	-	-	-	16(HE)	.02	NEG
M72A2	H557	-	8	-	-	36	-	122	1.56	.70
DRAGON	NL	-	4	15	-	12	-	58	NOTE 4	NOTE 4
TOW	NL	-	-	15	-	4	-	27	NOTE 4	NOTE 4
M33/M67	G881A	-	210	-	2	84	-	870	10.32	10.32
M34	G937A	-	12	-	6	-	6	1677	97.96	97.96
M18A1	K143	2	4	-	-	-	-	3841	1561	703
TNT (1 lb)	M032	-	24	-	-	-	-	42	.34	.11
SATCHEL CHG (20 lb)	M757	-	32	-	-	10.5	-	88	8.50	2.79

NOTE 1. TOTAL SCENARIO ACTIONS: 1917 DI, 1.75 UD, 1 CD, 125 UI, 3 ID, 151 SI.

2. ORGANIZATIONAL LOAD REQUIREMENT = BA + 15 DOA; TAKEN FROM MAGTF LIFT MODEL DTD 5 MARCH 81 FOR NOTIONAL MAF.

3. TOTAL REQUIREMENT = BA + MOUNT-OUT (60 DOA); TAKEN FROM MAGTF LIFT MODEL DTD 5 MAR 81 FOR NOTIONAL MAF.

4. MOUNT-OUT QUANTITIES FOR THESE WEAPONS ARE CLASSIFIED, BUT WHEN EXPENDITURES CAN READILY BE ACCOMMODATED.

Figure A-14. Class V (W) Requirements - Urban Offensive Operations

WEAPON SYSTEM OR TYPE	MINIMUM DAILY SYN CITY CLASS V(W) RQMNT[1]	REMARKS
ARMOR		
TANKS	0%	All with MCATFs
LVTs	10%	55% with MCATFs
ARTILLERY		
Self-Propelled	0%	All with MCATFs
Towed	10%	Note 2
ATGM		
TOW	0%	All with MCATFs
DRAGON, LAW	5%	Few appropriate targets
MORTARS	15%	
INDIVIDUAL WPNS		
MG	15%	
Rifle	20%	
Pistol	100%	High percentage due to low expenditure during offense
Shotgun	100%	
M203	15%	
GRENADE, HAND		
Frag	15%	
Concussion	10%	
Smoke	10%	
SIGNALS	15%	
MINES	*	See Chapter V - Engineer Countermobility
DEMOLITIONS	*	

Note 1 - Expressed in terms of percentage of daily offensive (Period II through V) Class V(W) requirement

2 - Virtually all howitzers left within the city will be supporting MCATF operations

Figure A-15. Class V (W) Planning Factors - Urban Defensive Operations (Period VI)

WEAPON SYSTEM OR TYPE	RNDS/WPN FIRST DAY[1]	URBAN DEFENSE FACTOR[2] MEAN	STD. DEV.	REMARKS
ARMOR				
Tanks (Main gun)	62	.85	.0840	Heavy use APFSDS
LVTs (M85)	N/A	1.2	.0894	
ARTILLERY				
Self-Propelled	190	1.0	.0632	Most howitzers firing targets forward of FEBA
Towed (155mm)	203	1.0	.0316	
ATGM				
TOW	9	.75	.0707	Urban vulnerability
DRAGON	3	1.25	.1095	
LAW	560	1.5	.1000	
MORTARS	116	1.1	.0922	
INDIVIDUAL WPNS				
MG (M60)	519	2.0	.2025	
Rifle (M16A1)	118	1.75	.1673	
Pistol	N/A	-		Conventional firing rates applicable
Shotgun	N/A	-		
M203	26	1.2	.1000	
GRENADE, HAND				
Frag	N/A	1.2	.0894	Mix: 90% Frag
Concussion	N/A			10% Concussion
Smoke	N/A			
SIGNALS	N/A	.85	.0894	
MINES	N/A	Note 3		
DEMOLITIONS	N/A	Note 3		

Note 1 - As given in or interpolated from Table 7-6 FM 101-10-1 w/Ch 1 dated 10 February 1978.

2 - Subjective estimate derived from Delphi technique; expresses an urban defense factor applied to conventional expenditure rates.

3 - Situationally dependent; requires detailed urban terrain analysis.

4 - Succeeding days (D+17, 18, 19, 20) factor - 80% of first day. Prolonged period (D+21 through D+40) factor - 33% of first day.

5 - Expenditure factors applicable to heavy intensity in Forward Defense Area.

Figure A-16. Class V (W) Planning Factors - Urban Defensive Operations (Period VII)

CLASS VII SELECTED ITEMS

NOMENCLATURE	TAMCN[1]	SUBCLASS[2]	TAM CARF[1] EI	TAM CARF[1] ES	URBAN CARF OFFENSE
Air conditioner, 400 HZ 18KBTU	B0004	B	.0137	.0072	.0224
Bath unit, trl mtd	B0060	B	.0500	.0250	.0310
Boat, bridge erection, 27'	B0110	B	.0612	.0215	.0579
Bridge, fixed, 60T	B0140	B	.1584	.0792	.0783
Bridge, float, M4T6	B0130	B	.1584	.0792	.0893
Bridge, float, foot	B0150	B	.0310	.0158	.0189
Carrier, cgo, M116A1	D0050	K	.0800	.0400	.1020
Carrier, cgo, M733	D0055	K	.0800	.0400	.2200
Compressor, air 250 CFM, trl	B0390	B	NL[4]	NL	.0070
Crane, RT, 30T	B0399	B	.0360	.0180	.0856
Crane, RT, 7T	B0445	B	.0518	.0275	.0864
Crane-shovel, crwl-mtd, 37-M55	B0400	B	.0600	.0300	.0192
Decon apparatus, M121A1	B0465	B	.0715	.0415	.1682
Detect set, mine, AN/PRS-7(8)	B0473	G	.2365	.1147	.2433
Detect set, mine, AN/PSS-11(Imp)	B0475	G	.1578	.0789	.2100
Detect set, seismic, AN/PSR-1A	A0490	G	.1000	.0500	.1960
DME, MRA-301	A0545	G	.0600	.0300	.0408
TAFDS, M1966	B0675	B	.0082	.0037	.0348
AAFS, M69HC	B0685	B	.0082	.0037	.0379
Generator, 3KW60, MEP-016A	B0730	B	.0504	.0261	.0541
Generator, 10KW60, MEP-003A	B0891	B	.0226	.0116	.0294
Generator, 30KW60, MEP-114A	B0971	B	.1000	.0500	.0658
Generator, 100KW60, MEP-007A	B1045	B	.1000	.0500	.0620
Grader, road, motorized, hvy	B1081	B	.0850	.0425	.0626
Heliport light set	A0815	G	.0200	.0100	.0490
HERS	B1135	B	.0082	.0037	.0538
Howitzer, SP, 8" M110A2	E0692	M	.1021	.0471	.1236
Howitzer, T, 105mm, M101A1	E0640	M	.0600	.0300	.0996
Howitzer, SP, 155mm, M109A3	E0663	M	.1335	.0632	.1537
Howitzer, T, 155mm, XM198	E0670	M	.0400	.0200	.0650
Ice cream plant, M33	B1160	B	NL	NL	.0443
Landing veh, FT, LVTC7	E0795	K	.1600	.0800	.1962
Landing veh, FT, LVTP7	E0845	K	.1600	.0800	.1940
Landing veh, FT, LVTR7	E0855	K	.1600	.0800	.2016
Launcher, rkt, M202A1	E0900	M	.4211	.1876	.2840
Launcher, TOW, M220AE1	E0935	B	.2868	.1130	.1514
Mixer, concrete, 16S-2A	B1325	B	NL	NL	.1598
MPWS	E1041	B	NL	NL	.2095
Mortar, 81mm, M29E1	E1090	M	.2837	.1349	.2118
Mortar, 60mm, M19 (XM244)	E1060	M	.2340	.1170	.2376
Night vision sight, crew svd	E1159	G	.2825	.1303	.2153
Radio set, AN/GRA-39A control	A1730	G	.0800	.0400	.1956
Radio set, AN/VRC-47	A2150	G	.1570	.0736	.1363
Recovery veh, M88A1	E1377	K	.0440	.0222	.1210
Refrigerator, prefab, 630CF	B1700	B	.0100	.0042	.0098
Roller, pneu tire	B1790	B	NL	NL	.0102
Saw, chain, port	B1830	B	NL	NL	.1516
Saw, radial, woodworking	B1840	B	.0600	.0300	.0205
Scraper, towed	B1920	B	.0273	.0166	.0250
Semi-trl, fuel, 5000G	D0215	K	.0200	.0100	.0280
Semi-trl, low bed, 40T	D0235	K	.0200	.0100	.0154
Semi-trl, 65T, M793	D0200	K	NL	NL	.0162
Switchboard, SB-22/PT	A2480	G	.0660	.0330	.0538
Tank, combat, M60A1	E1875	M	.3902	.1151	.3216
Tank, combat, M60A1 W/M9	E1876	M	.3902	.1151	.4016
Tank, fabric, collaps, 3000G	B2130	B	.0312	.0182	.0736
Tractor, MC450	B2444	B	.1000	.0500	.0868
Tractor, MC1150, MP buck	B2463	B	.1447	.0673	.0848
Tractor, Terex 82-30FM-M3	B2462	B	.0316	.0161	.0548
Tractor, Terex 72-31MP	B2465	B	.0600	.0300	.0608
Tractor, util, GSE, MF40	B2464	B	NL	NL	.1173
Trailor, water, M148A1	D0880	K	.0618	.0279	.0554
Trailer, cgo, 1 1/2T	D0860	K	.0618	.0279	.0484
Truck, util, 1/4T, M151A2 (HMTT)	D1160	K	.0748	.0491	.1526
Truck, plat, 1/2T, M274A5 (HMTT)	D1100	K	.0500	.0250	.1844
Truck, cgo, 2 1/2T M35A2C (HMTT)	D1030	K	.0400	.0200	.0804
Truck, forklift, 6000 lb., RT	B2560	B	.0600	.0300	.0938
Truck, tank, fuel, M49A2C	D1100	K	.0400	.0200	.0824
Truck, tractor, 5T, M52A2	D1130	K	.0400	.0200	.0653
Water, purif equip, 1500 GPH	B2605	B	.0500	.0250	.0526

Note 1 - From NAVMC 1017 - TAM Revision #6, 25 Nov 80
2 - Subclass commodity designator, all items Type 1 material
B - Ground support K-Tactical vehicles E - General Supplies T - Industrial Supplies
G - Electronics M - Weapons F - Clothing & textiles

Figure A-17. Class VII Combat Active Replacement Factors (CARFs) - Urban Offensive Operations

CLASS VII SELECTED ITEMS

NOMENCLATURE	TAMCN[1]	SUBCLASS[2]	TAM CARF[1] EI	TAM CARF[1] ES	URBAN CARF DEFENSE MEAN	URBAN CARF DEFENSE STD. DEV.
Air conditioner, 400 HZ 18KBTU	B0004	B	.0137	.0072	.0250	.0037
Bath unit, trl mtd	B0060	B	.0500	.0250	.0510	.0036
Boat, bridge erection, 27'	B0110	B	.0612	.0215	.0625	.0044
Bridge, fixed, 60T	B0140	B	.1584	.0792	.0932	.0119
Bridge, float, M4T6	B0130	B	.1584	.0792	.1231	.0160
Bridge, float, foot	B0150	B	.0310	.0158	.0165	.0019
Carrier, cgo, M116A1	D0050	K	.0800	.0400	.1237	.0088
Carrier, cgo, M733	D0055	K	.0800	.0400	.2560	.0144
Compressor, air 250 CFM, trl	B0390	B	NL	NL	.0850	.0068
Crane, RT, 30T	B0399	B	.0360	.0180	.1210	.0104
Crane, RT, 7T	B0445	B	.0518	.0275	.1162	.0113
Crane-shovel, crwl-mtd, 37-M55	B0400	B	.0600	.0300	.0165	.0014
Decon apparatus, M12IA1	B0465	B	.0715	.0415	.2372	.0164
Detect set, mine, AN/PRS-7(8)	B0473	G	.2365	.1147	.1986	.0111
Detect set, mine, AN/PSS-11(Imp)	B0475	G	.1578	.0789	.1740	.0158
Detect set, seismic, AN/PSR-1A	A0490	G	.1000	.0500	.2317	.0175
DME, MRA-301	A0545	G	.0600	.0300	.0300	.0035
TAFDS, M1966	B0675	B	.0082	.0037	.0798	.0034
AAFS, M69MC	B0685	B	.0082	.0037	.0925	.0046
Generator, 3KW60, MEP-016A	B0730	B	.0504	.0261	.0620	.0052
Generator, 10KW60, MEP-003A	B0891	B	.0226	.0116	.0577	.0038
Generator, 30KW60, MEP-114A	B0971	B	.1000	.0500	.0712	.0025
Generator, 100KW60, MEP-007A	B1045	B	.1000	.0500	.0765	.0027
Grader, road, motorized, hvy	B1081	B	.0850	.0425	.0723	.0039
Heliport light set	A0815	G	.0200	.0100	.0462	.0034
HERS	B1135	B	.0082	.0037	.0441	.0039
Howitzer, SP, 8" M110A2	E0692	M	.1021	.0471	.1337	.0044
Howitzer, T, 105mm, M101A1	E0640	M	.0600	.0300	.0985	.0044
Howitzer, SP, 155mm, M109A3	E0663	M	.1335	.0632	.1658	.0044
Howitzer, T, 155mm, XM198	E0670	M	.0400	.0200	.0675	.0033
Ice cream plant, M33	B1160	B	NL	NL	.0450	.0033
Landing veh, FT, LVTC7	E0795	K	.1600	.0800	.1600	.0074
Landing veh, FT, LVTP7	E0845	K	.1600	.0800	.1620	.0046
Landing veh, FT, LVTR7	E0855	K	.1600	.0800	.2231	.0176
Launcher, rkt, M202A1	E0900	M	.4211	.1876	.3317	.0293
Launcher, TOW, M220AE1	E0935	B	.2868	.1130	.2520	.0151
Mixer, concrete, 16S-2A	B1325	B	NL	NL	.0894	.0054
MPGS	E1041	B	NL	NL	.2560	.0152
Mortar, 81mm, M29E1	E1090	M	.2837	.1349	.4255	.0550
Mortar, 60mm, M19 (XM244)	E1060	M	.2340	.1170	.4117	.0117
Night vision sight, crew svd	E1159	G	.2825	.1303	.4237	.0307
Radio set, AN/GRA-39A control	A1730	G	.0800	.0400	.1950	.0115
Radio set, AN/VRC-47	A2150	G	.1570	.0736	.1520	.0056
Recovery veh, M88A1	E1377	K	.0440	.0222	.1458	.0087
Refrigerator, prefab, 630CF	B1700	B	.0100	.0042	.0125	.0026
Roller, pneu tire	B1790	B	NL	NL	.0100	.0015
Saw, chain, port	B1830	B	NL	NL	.0765	.0030
Saw, radial, woodworking	B1840	B	.0600	.0300	.0153	.0010
Scraper, towed	B1970	B	.0273	.0166	.0132	.0010
Semi-trl, fuel, 5000G	D0215	K	.0200	.0100	.0567	.0079
Semi-trl, low bed, 40T	D0235	K	.0200	.0100	.0225	.0033
Semi-trl, 65T, M793	D0200	K	NL	NL	.0183	.0021
Switchboard, SB-22/PT	A2480	G	.0660	.0330	.0814	.0088
Tank, combat, M60A1	E1875	M	.3902	.1151	.3970	.0320
Tank, combat, M60A1 W/M9	E1876	M	.3902	.1151	.4013	.0144
Tank, fabric, collaps, 3000G	B2130	B	.0312	.0182	.0916	.0036
Tractor, MC450	B2444	B	.1000	.0500	.1000	.0076
Tractor, MC1150, MP buck	B2463	B	.1447	.0673	.1315	.0046
Tractor, Terex 82-30FM-M3	B2462	B	.0316	.0161	.0791	.0042
Tractor, Terex 72-31MP	B2465	B	.0600	.0300	.0836	.0047
Tractor, util, GSE, MF40	B2464	B	NL	NL	.0563	.0066
Trailer, water, M148A1	D0880	K	.0618	.0279	.0775	.0041
Trailer, cgo, 1 1/2T	D0860	K	.0618	.0279	.0391	.0015
Truck, util, 1/4T, M151A2	D1160	K	.0748	.0491	.0982	.0079
Truck, plat, 1/2T, M274A5	D1100	K	.0500	.0250	.1771	.0040
Truck, cgo, 2 1/2T M35A2C	D1030	K	.0400	.0200	.1226	.0066
Truck, forklift, 6000 lb., RT	B2560	B	.0600	.0300	.1279	.0040
Truck, tank, fuel, M49A2C	D1100	K	.0400	.0200	.1513	.0049
Truck, tractor, 5T, M52A2	D1130	K	.0400	.0200	.0711	.0031
Water, purif equip, 1500 GPH	B2605	B	.0500	.0250	.0757	.0034

Note 1 - From NAVMC 1017 - TAM Revision #6, 25 Nov 80
2 - Subclass commodity designator, all items Type 1 material
B - Ground support K-Tactical vehicles E - General Supplies T - Industrial Supplies
G - Electronics M - Weapons F - Clothing & textiles

Figure A-18. Class VII Combat Active Replacement Factors (CARFs) - Urban Defensive Operations

ITEM	COMBAT SERVICE SUPPORT IMPACT (MAF)						
	ENGR	MHE	EMBARK	SUPPLY	TRANS	MAINT	CSS TNG
M1	++[1]	+	+	+	+	++	++
LAV	++[1]	+	++	+	+	++	+
MPGS	+[1]	+	++	+	+	++	+
LCAC	N	N	++	N	*	N	N
CH-53E	N	N	N	N	*	-	N
AV-8B	N	N	N	N	N	-	N
F/A-18	N	N	N	N	N	-	N
MT	N	N	+	N	*	N	N
MHE	N	*	+	N	N	N	+
M198	N	+	N	+	+	N	N
SMAW	N	+	+	+	+	+	+
MK19	N	+	+	+	+	+	+
SAW (NOTE 8)	N	N	N	N	N	+	+
M16A1 PIP	N	N	N	N	N	-	N
VIPER (NOTE 9)	N	N	N	N	N	N	N
STINGER (NOTE 9)	N	N	N	N	N	N	N
COMM EQUIP	N	N	N	N	N	+	+
ALS	+++[2]	++	++	N	+++	+	+
		Note 3	Note 4	Note 5		Note 6	Note 7

Key: +(-) Slightly increased (decreased) requirement - minor impact

++(--) Moderately increased (decreased) requirement - moderate impact

+++(---) Greatly increased (decreased) requirement - major impact

N Insignificant impact

* Item directly related to CSS function - major impact

Note 1 Increased bulk fuel requirement.
2 Increased PHIBCB requirement for ALS installation.
3 Most increases (except ALS) due to additional Class V handling.
4 Additional square and cube requirements.
5 Increases due to additional or new Class V or IX items.
6 New maintenance procedures for new items.
7 CSS Tng to accomplish new maintenance procedures.
8 Includes effects of M60 deletions in divisional unit TO&Es.
9 VIPER and STINGER are essentially one-for-one replacements for LAW and REDEYE.

Figure A-19. Combat Service Support Impact of Mid-Range Equipment Introductions

US Army Civil Affairs Functional Teams	USA Team [1]	Agg. Str	Required Level of Performance to D+30	4th CAG Capability	Augmentation Required [1] Team	Str
Arts, Monuments, & Archives	FB	5	Not Required			
Civil Defense	GB	5	Not Required			
Civil Information	HB	5	Plan, direct, supervise	CAG Hq/PA/CommBn		
Civilian Supply	IB	5	Survey, supervise		IB	5
Displaced Persons, Refugees, Evacuees	JB	6	Coordinate, administer, advise	CAG Dets/FSSG		
Economics & Commerce	KB	7	Not Required			
Food & Agriculture	LB	5	Survey, supervise		LB	5
Labor	MB	4	Supervise, coordinate	CAG/FSSG		
Property Control	NB	4	Supervise		NB	4
Public Administration	OB	5	Liaison, monitor	CAG HQ		
Public Communications	PB	5	Analyze, evaluate, administer		PB	5
Public Education	QB	5	Not Required			
Public Finance	RB	5	Not Required			
Public Health	SB	7	Analyze, supervise, coordinate	CAG/FSSG		
Public Safety	TB	5	Supervise, advise [2]		TB [2]	10
Public Transportation	UB	5	Evaluate, supervise [3]		UB	5
Public Welfare	VB	4	Not Required			
Public Works & Utilities	WB	5	Evaluate, supervise, advise		WB	5
Religious Relations	XA	2	Not Required [4]			
Tribunals	YB	5	Not Required			
Language Teams	ZB	4	Not Required [5]			
						39

1/ Requirements are shown in terms of US Army Civil Affairs Functional Teams described in FM 101-10-2. The 4th CAG will require augmentation in several functional areas with the same capabilities and approximate strengths.
2/ Two Public Safety Teams are needed to provide timely staff support, liaison, survey, and enforcement of orders relating to security control of the populace, plus supervision of police, fire department, and prison operations. Fire-safety personnel must have demonstrated skills and experience in all aspects of preventing, controlling, and fighting fires in urban areas.
3/ A Public Transportation Team is needed to evaluate the status and potential operability of the two rail networks and coordinate and supervise repairs, maintenance, and operation if restoration of some railroad service is possible.
4/ A Religious Relations Team will be required if the predominant religion in the area is sufficiently different from those in the US. Religious scholars and linguists may be needed.
5/ Language Teams or some other outside support will be required if the 15 Marine Fleet Assistance/Contingency billets in 4th CAG cannot be filled with Marines fluent in the Aggressor language.

Figure A-20. Civil Affairs Group Augmentation Requirements - Offensive Operations

Class V Items (Current Inventory)

Ctg, rifle, sniper
Ctg, shotgun
Ctg, M203, M433 (HE DP) and M651 (CS)
Ctg, mortar, illuminating (M83A3 and M301A3)
Ctg, tank, 105 mm, M393A2 (HEP-T)
M494 (APERS)
Ctg, howitzer, 105 mm, M314A3 (Illum)
M84A1 (HC Smoke)
Demolition materials, all
Grenade, hand, frag M67
offensive MK3A2
smoke HC
Projectile, flame weapon
breaching weapon
Fuse, delay (concrete piercing)

Class II Items (Current Inventory)

Armor, body
Armor kit, vehicle
Batteries, mine detector
Bayonet
Belt, safety, industrial
Breathing apparatus, oxygen gen.
Cable, coaxial
Cable, tele WD-1/TT
Climbers, pole
Demo equip set, individual
Flashlights (and batteries)
Glove shells, black
Pistol, individual
Rifle, individual
Rifle, sniper
Retransmission kit, radio
Rope, 1" manila or sisal
Seal, strapping
Shotgun
Sight, night vision, individual
Sign painting set
Stencil sets
Tablet, water purification
Tag, blank, asst. colors
Tape, insulating, electrical
Tape, engineer
Tarpaulin

Class IV

Barbed wire, 350' spool
Bag, burlap
Barbed wire, concertina
Barbed tape, GPBTO

Class VII

Breaching weapon, manportable
Detector, mine
Dispenser, RCA
Firefighting equip
Flame weapon, manportable
Generators, smoke
Public address sets
Radio antennas
Radio set, PRC-77
Seismic instrusion sets
Telephone set, TA-1/PT
Telephone set, TA-312/PT

Class II Items (Non-inventory)

Eavesdrop equip, electronic
Ladder, STABRU
Mirror kit, w/poles
Transformer, step-down, 220/110

Figure A-21. Recommended PWRM Urban Project Stock Items

UNIT	CSS TRAINING TOPIC	MOBILE TRAINING TEAM	PROF DEVELOPMENT SEMINAR	COMMAND POST EX	MOS SCHOOL	PRACTICAL EXERCISE
		TRAINING METHOD				
SUPPLY BN, FSSG	BUILDING REQUIREMENTS FOR SUPPLY STORAGE	x	(x)			x
	CAMOUFLAGE OF SUPPLIES (URBAN EXPEDIENTS)	x				(x)
	MATERIALS HANDLING WITHIN CONFINED AREAS				x	(x)
	FORWARD SALVAGE OPERATIONS		(x)		x	(x)
MAINTENANCE BN, FSSG & OTHER 2ND ECHELON MAINTENANCE ELEMENTS	UTILIZATION OF URBAN MAINTENANCE FACILITIES	x	(x)			
	FORWARD MAINTENANCE OPERATIONS (CONTACT TEAM)		(x)		x	(x)
	EQUIPMENT HARDENING IN URBAN AREAS	(x)	x			x
TRUCK CO, MARDIV MT BN, FSSG & OTHER UNITS WITH MT CAPABILITIES	VEHICULAR MANEUVERABILITY IN CONFINED AREAS	x			x	(x)
	VEHICULAR HARDENING REQUIREMENTS	(x)	x			x
	CONVOY OPERATIONS IN URBAN AREAS	x	(x)		x	x
ENGR SUPT BN, FSSG	SUPPORT REQUIREMENTS FOR PORT AND AIRFIELD REHABILITATION	(x)	x			
	INTERFACE WITH CIVILIAN UTILITY NETWORKS	(x)			x	x
WING ENGR SQDN	RAPID RUNWAY REPAIR (R^3) TECHNIQUES	(x)	x		x	(x)
ALL COMMUNICATIONS UNITS & ELEMENTS	COMMUNICATION TECHNIQUES IN URBAN AREAS	x	x	(x)	x	(x)
MP CO, MARDIV	RIOT CONTROL OPERATIONS		x		x	(x)
MP CO, FSSG	EVACUATION AND REFUGEE CONTROL		(x)		x	x
CIVIL AFFAIRS GROUP	ALL ASPECTS OF CA OPERATIONS IN URBAN AREAS	x	x	(x)		

x SUITABLE TRAINING METHOD

(x) PRIMARY TRAINING METHOD(S)

Figure A-22. Combat Service Support Training Topics for Urban Warfare

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