



US Army Corps
of Engineers

Construction Engineering
Research Laboratory

USA-CERL TECHNICAL REPORT N-88/16
August 1988

2

AD-A200 355

Army Master Planning: An Analysis of Policy and Procedures

by

I. Wes Wheeler
John J. Fittipaldi
Clyde W. Forrest
Richard M. Marlatt

This report contains a proposed comprehensive land use planning process for Army installations, along with a broad review of the theories, techniques, and history of master planning in general and an analysis of Army master planning. It addresses the following questions: (1) What tools are available to implement land use planning? (2) How does (should) the Army master planning process work? (3) Which regulations affect Army master planning? (4) What type of comprehensive land use planning implementation process will meet Army installations' needs, given the findings from the previous three questions?

Based on the findings from the questions, the report has three recommendations.

1. Create a standard installation land use planning process, incorporating recent revisions to Army Regulation (AR) 210-20, *Master Planning for Army Installations*, and replacing conflicting or obsolete standards with state-of-the-art planning techniques.

2. Assemble references from the many related ARs and guidance documents into one users' guide, to be used as a single reference for installation master planners and MACOM reviewers. An appendix includes a preliminary effort to list the applicable regulations.

3. At some future time, codify the related ARs into a subject-indexed code that reflects that standard land use planning process.

Approved for public release; distribution is unlimited.

DTIC
ELECTE
OCT 25 1988
S D

88 1024 072

The contents of this report are not to be used for advertising, publication, or promotional purposes. Citation of trade names does not constitute an official indorsement or approval of the use of such commercial products. The findings of this report are not to be construed as an official Department of the Army position, unless so designated by other authorized documents.

*DESTROY THIS REPORT WHEN IT IS NO LONGER NEEDED
DO NOT RETURN IT TO THE ORIGINATOR*

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

Form Approved
OMB No 0704 0188
Exp Date Jun 30 1986

1a REPORT SECURITY CLASSIFICATION Unclassified			1b RESTRICTIVE MARKINGS		
2a SECURITY CLASSIFICATION AUTHORITY			3 DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; distribution is unlimited.		
2b DECLASSIFICATION/DOWNGRADING SCHEDULE					
4 PERFORMING ORGANIZATION REPORT NUMBER(S) USA-CERL TR N-88/16			5 MONITORING ORGANIZATION REPORT NUMBER(S)		
6a NAME OF PERFORMING ORGANIZATION U.S. Army Construction Engr Research Laboratory		6b OFFICE SYMBOL (if applicable) FCEN-CDP-M		7a NAME OF MONITORING ORGANIZATION	
6c ADDRESS (City, State, and ZIP Code) P.O. Box 4005 Champaign, IL 61820-1305		7b ADDRESS (City, State, and ZIP Code)			
8a NAME OF FUNDING/SPONSORING ORGANIZATION HQFORSCOM		8b OFFICE SYMBOL (if applicable) FCEN-CDP-M		9 PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER IAO No. 30-86	
8c ADDRESS (City, State, and ZIP Code) Fort McPherson, GA 30330-6000		10 SOURCE OF FUNDING NUMBERS			
		PROGRAM ELEMENT NO		PROJECT NO	TASK NO
				WORK UNIT ACCESSION NO	
11 TITLE (Include Security Classification) Army Master Planning: An Analysis of Policy and Procedures (U)					
12 PERSONAL AUTHOR(S) Wheeler, I. Wes; Fittipaldi, John J.; Forrest, Clyde W.; Marlatt, Richard M.					
13a TYPE OF REPORT final		13b TIME COVERED FROM _____ TO _____		14 DATE OF REPORT (Year, Month, Day) 1988, August	
				15 PAGE COUNT 54	
16 SUPPLEMENTARY NOTATION Copies are available form the National Technical Information Service Springfield, VA 22161					
17 COSATI CODES			18 SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB-GROUP			
13	02		land use planning		
19 ABSTRACT (Continue on reverse if necessary and identify by block number)					
This report contains a proposed comprehensive land use planning process for Army installations, along with a broad review of the theories, techniques, and history of master planning in general and an analysis of Army master planning. It addresses the following questions: (1) What tools are available to implement land use planning? (2) How does (should) the Army master planning process work? (3) Which regulations affect Army master planning? (4) What type of comprehensive land use planning implementation process will meet Army installations' needs, given the findings from the previous three questions? (Continued)					
20 DISTRIBUTION AVAILABILITY OF ABSTRACT ☐ UNCLASSIFIED-UNLIMITED ☒ SAME AS RPT ☐ DTIC USERS			21 ABSTRACT SECURITY CLASSIFICATION		
22a NAME OF RESPONSIBLE INDIVIDUAL Jane Andrew			22b TELEPHONE (Include Area Code) (217) 352-6511, ext 388		22c OFFICE SYMBOL CECER-IMT

DD FORM 1473, 84 MAR

8: APR edition may be used until exhausted
All other editions are obsoleteSECURITY CLASSIFICATION OF THIS PAGE
Unclassified

Unclassified

Block 19. (Continued)

Based on the findings from the questions, the report has three recommendations.

1. Create a standard installation land use planning process, incorporating recent revisions to Army Regulation (AR) 210-20, *Master Planning for Army Installations*, and replacing conflicting or obsolete standards with state-of-the-art planning techniques.
2. Assemble references from the many related ARs and guidance documents into one users' guide, to be used as a single reference for installation master planners and MACOM reviewers. An appendix includes a preliminary effort to list the applicable regulations.
3. At some future time, codify the related ARs into a subject-indexed code that reflects that standard land use planning process.

Unclassified

FOREWORD

This project was performed for Headquarters, U.S. Army Forces Command (HQFORSCOM), Master Planning Branch, under Intra-Army Order (IAO) No. 30-86, dated 12 March 1986, entitled "Model Development Techniques for FORSCOM Installations." Mr. James Carmody (FCEN-CDP-M) was the HQFORSCOM Technical Monitor.

The work was performed by the Environmental (EN) Division of the U.S. Army Construction Engineering Research Laboratory (USA-CERL), with assistance from Professor Clyde Forrest of the Department of Urban and Regional Planning, University of Illinois at Urbana-Champaign. Dr. R. K. Jain is Chief of USA-CERL-EN. The USA-CERL Principal Investigator and point of contact is Mr. John Fittipaldi. The technical editor was Jane Andrew, Information Management Office.

COL Carl O. Magnell is the Commander and Director of USA-CERL, and Dr. L. R. Shaffer is the Technical Director.

Accession For		
NTIS	CRA&I	☒
DTIC	TAB	☐
Unpublished		☐
By		
Date		
Dist		
A-1		



CONTENTS

	Page
DD FORM 1473	1
FOREWORD	3
1 INTRODUCTION	5
Background	
Objective	
Approach	
Scope	
2 URBAN AND REGIONAL PLANNING THEORIES AND TECHNIQUES.....	7
Land Use Planning	
Police Power Regulations	
Environmental Planning	
Site Planning and Design	
3 ARMY INSTALLATION MASTER PLANNING	15
History	
Uniqueness of Army Master Planning	
Scope of Army Master Planning	
Goals of an Installation Master Plan	
4 ARMY PLANNING REGULATIONS	22
Funding and Approval Requirements	
AR 210-20, Master Planning for Army Installations	
Other Regulations	
5 A PROPOSED LAND USE PLANNING PROCESS	30
Gathering Preliminary Information	
Preparing a Conceptual Development Plan	
Siting Land Uses in Conformance With the Conceptual Development Plan	
6 CONCLUSIONS AND RECOMMENDATIONS	39
Conclusions	
Recommendations	
REFERENCES	41
LIST OF ABBREVIATIONS AND ACRONYMS	46
APPENDIX A: Other Planning Processes Considered	48
APPENDIX B: Army Regulations Relevant to Master Planning, With Excerpted Citations	50
DISTRIBUTION	

ARMY MASTER PLANNING: AN ANALYSIS OF POLICY AND PROCEDURES

1 INTRODUCTION

Background

Today's military installations are facing severe budgetary constraints, lack of available land for needed growth and expansion, conflicting land uses, competing uses for the same piece of land (each with its own unique benefits and costs), and a multitude of other land use issues. In addition, these installations are also concerned with fulfilling mission statements, even as these mission statements are changing to adapt to the requirements of military readiness in the 21st century and beyond. The central issue facing installation decisionmakers is how to use limited resources to optimize the installation's performance in meeting its assigned mission while improving the installation residents' and employees' quality of life.

In the current Army master planning process, proposed land use siting decisions must be evaluated without a comprehensive, unified approach that incorporates the varied substantive criteria which are available. There have been a number of siting decisions for installations land uses that either created conflicts with surrounding uses or resulted in an ineffective use of the proposed facility. To address those concerns, the primary Army regulation (AR) governing master planning, AR 210-20,¹ has recently been revised extensively. The need now exists for a systematic installation land use planning and evaluation process to implement the directives of that regulation.

Objective

This study's primary objective was to propose an Army land use planning system which provides:

1. A procedural means to implement the Army's master planning goals and other requirements related to Army master planning
2. Flexibility to adopt installation-unique regulations
3. Coordination of installation master planning with the plans of surrounding communities
4. A standard system to assure that installation siting decisions are made as cost effectively as possible
5. Protection for the installation's natural environment and improvement of the quality of life for its residents and employees.

¹Army Regulation (AR) 210-20, *Master Planning for Army Installations* (Headquarters, Department of the Army [HQDA], 12 June 1987).

A system that meets these needs will create a more efficient and effective Army installation master planning process, both in the resources committed and in the timeliness of decisions.

A secondary objective was to provide a general primer and resource material for Army master planners and other interested decisionmakers.

Approach

To accomplish the study objective, the following four questions were addressed.

1. What are the current land use planning implementation tools?
2. How does (should) the Army master planning process work?
3. Which Army regulations or guidance documents affect installation master planning?
4. What type of comprehensive land use planning implementation process will accomplish the study objective, given the information from the previous three questions?

Chapter 2 addresses the first question with a review of current urban and regional planning literature. This chapter serves several purposes, including a review of theories and techniques which are used in the proposed process, concepts which are useful for installation master planners, and as a general primer of the master planning field. Chapter 3 addresses the second question, focusing on the scope and goals of the installation master plan. The third question is addressed in Chapter 4, which provides an overview of Army master planning regulations, including related regulations and documents that affect master planning. Chapter 5 is a culmination of the findings from the previous three chapters. It addresses the final question with a proposed process for comprehensive installation land use planning, which is the focal point of this study. Chapter 6 contains the study's recommendations and conclusions.

Scope

This technical report will emphasize a comprehensive land use planning process that focuses on the functional arrangement of land uses. This functional arrangement considers the relationships and compatibility of those uses with each other and with the natural environment. The intent of this process is to integrate the individual specialized facets of Army master planning into a systematic whole.

2 URBAN AND REGIONAL PLANNING THEORIES AND TECHNIQUES

This chapter reviews several theories and techniques of urban and regional planning. Its intent is to examine current tools for implementing land use planning.

Land Use Planning

Origins

Urban and regional planning in the United States has been a 20th-century development that has occurred primarily at the local level. There has been some State but little Federal action outside of the environmental planning arena (in which both levels have been active). Local comprehensive planning was founded as a hybrid of two popular political movements at the turn of the century, "good government" and the "City Beautiful" (modeled after Daniel Burnham's White City at the 1892 Worlds Fair). The first movement produced an emphasis on fair and rationally objective governmental decisions based on the public's health, safety, and welfare. The second emphasized a near-utopian urban center that is a pleasant place in which to live and work. Both movements were strong reactions to the corrupt political climate and the squalid slums and factories prevalent in that era. Despite the eight decades since then, the philosophy of local land use planning has changed little and still deeply reflects those values, although its tools and techniques have changed.

Local comprehensive plans tend to follow the example set in the 1928 Standard City Planning Enabling Act (SPEA).² These comprehensive plans typically include a statement of the community's goals, objectives, and policies along with an official map that depicts a preferred future development of the community which would meet those established policies. To allow for future expansion of the community, the area of jurisdiction on the official map typically includes a second border outside the corporate limits. These plans are not limited to land use planning: they should include all facets of community growth and development. But it is primarily through land use planning that the goals, objectives, and policies are achieved.

Role of Land Use Planning

"Master planning" and "land use planning" are not synonymous in today's complex interaction of interrelated and specialized disciplines. Land use planning is just one facet of master planning. Other facets which are also very important in presenting a comprehensive plan include economics, human services, transportation, capital improvements, etc. For this study, land use planning is considered the foundation upon which many of those other special areas depend. Land use planning is usually the most important consideration in local comprehensive plans, indicated by the fact that those plans are implemented by "official" maps. This study also focuses in on the land use planning as the fundamental means of implementing the installation master plan. Thus, when referring to the Army master planning requirements, "master planning" will be used, and when referring to the proposed system of implementation, "land use planning" will be used.

²Standard City Planning Enabling Act (U.S. Department of Commerce, Washington, DC, 1928).

"Land use planning" encompasses a wide array of activities. Literally, it is the planning for the future development, through improvements and/or facilities, of land within a given geographic area. While resource management may be considered one facet of land use planning, the two terms are not synonymous. Resource management is more narrowly confined to protecting and conserving natural resources, with an emphasis on the use of those resources in the production of products or services. Land use planning studies the best way to adapt the natural and man-made environments to the projected needs of the future. In other words, in land use planning a uniform set of land use principles and practices is comprehensively and rationally applied to solve or even preclude estimated future needs and problems. The epitome of traditional land use planning is the theories of Stuart Chapin in the (now classic) *Urban Land Use Planning*.³ Chapin establishes five basic elements of a land use planning program:

1. The plan for planning: determination of basic parameters
2. Building the information system base
3. Problem analysis and goal specification
4. Advance formulation of policies/plans
5. Action planning: real-time participation in current problem solving and impact assessment.

This essentially is a comprehensive planning process applied to land use. It is the prototypical process of preparing and revising local comprehensive plans.

Implementation Approaches

There are four principal approaches to implementing local land use planning:

1. Eminent domain (the State's right to purchase private property at fair market price) and subsequent development or restrictions on the property to serve the public purpose.
2. Variable tax rates to encourage or discourage particular land uses.
3. Uniform taxes for each land use class which are then used for capital expenditures (usually reflected in budgets and capital improvement plans).
4. Exercise of police power regulations to protect the public's health, safety, and welfare (literally the authority to prevent or terminate an activity that is injurious to the public).

While all four approaches have been used, police power has been the cornerstone of local land use planning. Eminent domain is often quite expensive and may be difficult to justify to fiscally (and often politically) conservative taxpayers. Differential taxation is also limited for the same reason and also because many states have strict regulations against using the taxing authority to act as a police power to enforce local regulations. Capital improvement planning is perfectly legal and is practiced by most communities, so

³F. Stuart Chapin and Edward J. Kaiser, *Urban Land Use Planning* (University of Illinois Press, Urbana, IL, 1979).

long as the projects funded do not discriminate against any of the community's residents. Such projects have been a principal means of implementing local land use planning, but are increasingly limited in large cities and are not found in smaller cities because of constraints in funding (due in part to vanishing federal support and dwindling tax bases in the 1980's). That leaves communities with the police power to regulate potentially harmful activities as the fundamental means of implementing local comprehensive plans.

Police Power Regulations (Subdivision and Zoning Ordinances)

The two most widely accepted police power regulations which implement civilian master (comprehensive) plans are subdivision and zoning ordinances. Subdivision regulations deal principally with the division and/or recording of a single unit of land into two or more subunits, including the conveyance of easements and the demarcation of property or other boundary lines. The basic premise of these regulations is that those who develop a project (and thus reap its economic benefits) should also bear the costs of that development. If this were not required, the taxpayers would be providing an enormously profitable subsidy to the developers. Subdivision requirements usually pertain to lot design and permanent physical site improvements (streets, sewers, drainage, utilities, sidewalks, etc.). Because these permanent improvements on a military installation are met through the installation's capital improvement projects (that is, there is no separate "outside" profit maker from whom funds may be exacted to finance the improvements), this discussion focuses on zoning as the principal regulation available to the installations.

Zoning

First, what is "zoning"? In the most basic terms, zoning is the separation of land uses into categories of similar uses and the regulation of those uses within each category. In the United States, local government zoning ordinances are based on the state enabling legislation which authorizes those governments to zone. Almost without exception, those state enabling acts are based on the 1926 (rev. ed.) Standard State Zoning Enabling Act (SZE).⁴ As its authors stated, that act was intended to: "lessen congestion in the streets; to secure safety from fire, panic, and other dangers; to promote health and general welfare; to provide adequate light and air; to prevent the overcrowding of land; to avoid undue concentration of population... ."

The fundamental premise of zoning is that uses which are incompatible with each other, for whatever reason, should be separated to avoid damages to each use from that incompatibility. The best example of conventional zoning is an official zoning map which covers the entire local government's jurisdiction. The jurisdiction is divided into an orderly arrangement of districts. Each district contains a group of uses which have similar characteristics and which must follow the development and use standards set for that district in the zoning ordinance.

Historically, uses have been broadly categorized into residential, commercial, industrial, governmental, public use, agriculture, and conservation uses. The sublevels within each category vary according to the importance attached to that category by the local government. For example, a smaller bedroom community may have a need for a

⁴Standard State Zoning Enabling Act (U.S. Department of Commerce, Washington, DC, 1926 rev. ed.).

wide variety of housing and thus have a number of residential districts. Because there are typically fewer industries in these communities, they are likely to have only one or two industrial and commercial districts.

The standards for each district typically regulate the uses (both principal and secondary) allowed; the bulk, height, and location of structures on a site; the amount and location of open space on a site; the number of parking spaces required; and, often, provisions for discontinuing uses which do not meet the standards of the district (nonconformities). These rigid building envelope regulations have led to monotonous, "cookie cutter" urban landscapes. This criticism led to the development of alternatives to the traditional zoning techniques and applications. The best known and most widely practiced alternative is performance standards zoning.

Performance Standards Zoning

This method has been offered as a flexible alternative to the too-rigid confines of conventional zoning. Performance zoning is defined as: "A minimum requirement or maximum allowable limit on the effects or characteristics of a use, usually written in the form of regulatory language... . Performance standards in zoning might describe allowable uses with respect to smoke, odor, noise, heat, vibration, glare, traffic generation, visual impact, and so on, instead of the more traditional classifications of 'light' or 'heavy' lists of uses... . The performance standard approach is based on the technical ability to identify activities numerically (e.g., how much noise) and to measure them to see if they meet ordinance requirements."⁵

A recent (1973) major revision of performance zoning was created for Bucks County, PA by Lane Kendig and others on the staff of the Bucks County Regional Planning Commission. As presented in Kendig's book, *Performance Zoning*,⁶ this theory is a complex blending of carrying capacity, land use intensity standards, conventional zoning, and transfer of development rights (TDR). Kendig proposes four development standards to be applied to developable land. The first factor is "open space ratio" (o.s.r.), which is a ratio of the total acres in open space (area not in private parcels and not covered by an impermeable surface) divided by the total acres at the site to be developed. The second factor is "impervious surface ratio" (i.s.r.), which is a ratio of the total acres covered by impervious surfaces (areas which do not absorb rainfall) divided by the total acres at the site to be developed. Only one of the last two factors is applied to any given land use, depending on whether that use is residential or nonresidential. Density is the factor used for residential uses. Density is determined by the number of dwelling units (d.u.) divided by the total acres at the site to be developed. The nonresidential factor is floor area ratio (f.a.r.), which is the total square footage of all buildings divided by the total square footage of the site to be developed.

Obviously this system is complex, but reports from the field (in actual use) have indicated that once learned, it may not be any more difficult to administer than traditional zoning techniques. It should be noted that in its application, performance zoning is often modified to simplify its use, with many procedures and requirements altered or dropped altogether.

⁵Michael J. Meshenberg, *The Language of Zoning: A Glossary of Words and Phrases*, Planners Advisory Service (PAS) Report #322 (American Society of Planning Officials [ASPO], Chicago, 1976).

⁶Lane Kendig, et al., *Performance Zoning* (American Planning Association [APA] Planners Press, Chicago, 1980).

Other Approaches

There have also been a number of other new tools and techniques developed in urban and regional planning. Some of those most directly related to land use planning include planned unit developments (PUDs), transfer of development rights (TDR), and development impact fees. Major new subdisciplines of land use planning have evolved, including environmental and site planning.

Planned unit developments (PUDs) are development projects planned together to maximize the efficiency and harmony with which the individual project uses interact. For example, a PUD may include residential, retail, warehousing, office space, etc. Each use should complement the others. PUD regulations reflect this unified approach. Often, the regulations are a combination of the separate zoning and subdivision regulations. The advantage of PUDs is that through combining a variety of uses at one site (usually not allowed under "straight zoning") and designing them to make better use of common areas and facilities, the local government can be more lenient and thus be able to encourage, rather than stifle, innovative site design. *This PUD concept is a useful one to apply to Army installations. The entire installation is a unit to be developed in a coordinated, comprehensive system that encourages better site design through planning for all the land use interactions on the installation.*

TDR is a resource protection device. It is typically initiated for environmentally or historically sensitive sites. The basic premise of this technique is that there are unique resources at a given site which should be saved from possible destruction by new development there. Calculations are made on the amount of development which could occur without harming the resource. If there is a level of development above the calculated limit, which otherwise would be allowed under the existing land use regulations, then those additional development rights are transferrable to another designated site (usually in a special receiving district). This device helps to protect the public's interest by preserving unique resources without causing undue hardship on the owners of those resources. *Again, this technique is a useful concept for Army installations.* Mission statement requirements which would otherwise harm unique on-base sites can still be met by moving the necessary development to areas which can accommodate it.

Developmental impact fees have become a major issue for local governments in the austere financial environment of the 1980's. The essence of these fees is the recognition that new development creates a number of financial impacts for those local governments, which developers should share since they reap the economic benefits of that development. An implicit understanding of the cost of new development has been reflected in subdivision regulations for a number of years (thus the requirements that developers provide adequate permanent improvements). However, an express statement of a much broader scope of impacts was made through the American Law Institute's *A Model Land Development Code*.⁷ Formally adopted in 1976, the Code is a model for State legislatures to follow in drafting land development enabling legislation for their local governments. The stated intent of its drafters was to provide timely guidance to replace the outdated SPEA and SZEAL models, which were drafted in the 1920's. Those previous models were seen as too limited and too restrictive; thus, the local governments were not able to regulate the entire range of impacts (such as environmental) and/or where regulations applied, their limiting restrictions only prevented poor development and did nothing to promote innovative site planning or design. As stated in Section 1-202, "Development": "...development' means the performance of any building or mining

⁷ *A Model Land Development Code* (The American Law Institute, Philadelphia, 1975).

operation, the making of any material change in the use or appearance of any structure or land, the division of land into two or more parcels, and the creation or termination of rights of access or riparian rights." Of the several land use planning techniques discussed here, this developmental impact approach is the most important in providing an understanding of Army master planning. It should be understood that all proposed developments, including relocations of structures or personnel, new or changed assignments, new construction, expansion of current uses, etc., have a developmental impact. Assessing that impact and identifying the best means of accommodating it are the functions of installation land use planning.

Environmental Planning

A principal offshoot of traditional land use planning has been environmental planning, an area in which the Federal and State governments have been very involved. This field of planning became prominent in the late 1960's and early 1970's with passage of major Federal acts, including the Clean Air and Water Bills and the National Environmental Policy Act (NEPA). Although there had been earlier attempts at environmental conservation (e.g., the national parks and forests acts in the early 1900's), the environmental "movement" was a reaction to the environmental degradation caused by increasing industrialization and urbanization in the 1950's and 1960's. Major state efforts in environmental planning have included Hawaii's state-wide land use planning requirements; California's air quality control and coastal protection programs; Florida's coastal and wetlands protection acts; and New York and Virginia's agricultural preservation districts.

One of the founding fathers of environmental planning is Ian McHarg, best known for his theory of "environmental capacity analysis," expressed in his book *Design With Nature*.⁸ The basis of this theory is to identify, map, and discourage development on environmentally sensitive areas. This is accomplished through the preparation of environmental base maps which are overlaid to create a composite map which may be used as a basis for rational plans.

A principal refinement to McHarg's environmental capacity concept, advanced by David Godschalk, et al., is the concept of "carrying capacity:"⁹ the ability of the natural environment to sustain new development without sustaining degradation. This idea emphasizes the cause and effect relationships between land development and the natural environment in which it occurs (the imposition of a man-made environment). This approach allows a more direct control of development's effects without blanket restrictions on development. It promotes the harmonious development of land within, and up to, its natural carrying capacity. Godschalk's theory has been refined itself, through George Nieswand and Peter Pizor's concept of "current planning capacity," which applies carrying capacity to a growth management program.¹⁰ The important difference of this theory is its recognition of man's ability to affect an environmental system through changes in lifestyle, technology, and infrastructure (i.e., to mitigate adverse impacts through positive interaction).

⁸Ian L. McHarg, *Design with Nature* (The Natural History Press, Garden City, NY, 1969).

⁹David R. Godschalk, Francis H. Parker, and Thomas R. Knoche, *Carrying Capacity: A Basis for Coastal Planning?* (University of North Carolina, Chapel Hill, NC, 1974).

¹⁰George Nieswand and Peter Pizor, *Current Planning Capacity: A Practical Carrying-Capacity Approach to Land Use Planning*, Extension Bulletin #413 (Rutgers University, New Brunswick, NJ, undated).

Site Planning and Design

Another important branch of land use planning is site planning and design. This specialty deals with the natural features and functional relationships of a site. Site design/planning has a number of goals aimed at creating the best possible future land development at a given site. Perhaps the most important is the internal and external web of land use relationships which defines the character of a site and how effectively it is used. If a use or uses are either isolated or cause unpleasant external conditions for surrounding, supporting uses, the offending use(s) may be abandoned. At the very least, it will likely be expensive and/or difficult to maintain it. Environmental compatibility and enhancement are very important goals. The manmade improvements and facilities at a site should be integrated into the natural environmental system, not imposed on it in a hostile manner. If development is environmentally incompatible, the site will be unpleasant to work or live in, will be expensive to maintain due to the environmental degradation, and will eventually fail if the natural system is unable to adapt to the new development.

Other goals of site planning are placing buildings to make the best use of solar gain and to avoid extreme weather exposure, and planning circulation and utility networks to maximize energy efficiency.

Siting uses so that there may be future adaptation or expansion of the site will be an integral factor in the useful life of a site. The intent should be to create a site that meets the needs of current users and is also flexible enough to accommodate the needs of future users. The goal is to use the land and other resources so that future development meets the maximum number of user needs with a minimum expenditure of land and resources. In other words, development should be cost effective, with a comprehensive view of all the liabilities and assets (both financial and nonfinancial) incurred through development. Of the many authors and experts in site design, the late Kevin Lynch is one of the most respected. In his book *Site Planning*,¹¹ Lynch states that the purpose of site planning is to focus on both the natural features of a site (enhance the desired features and lessen the impact of undesirable features) and the purposes for which it will be used. Lynch identifies eight stages of site planning:

1. Define the problem
2. Perform programming and analysis of site and user
3. Develop schematic design and preliminary cost estimates
4. Develop final design and detailed costing
5. Write contract documents
6. Manage bidding and contracting
7. Oversee construction
8. Occupy and manage the site.

¹¹ Kevin Lynch and Gary Hack, *Site Planning*, 3rd ed. (MIT Press, Cambridge, MA, 1984).

It would be useful for installation master planners to read this book when planning for major new development on an installation, if only to gain an understanding of the relationships involved in site planning and of the means of observing and accommodating those relationships.

An important source book which is of great assistance in site planning is De Chiara and Koppleman's *Urban Planning and Design Criteria*.¹² This book covers a wealth of information, from codes and ordinances to land use compatibilities to dimension specifications for parking spaces. As with Chapin and Kaiser's and Lynch's texts, it is a basic reference for a planner's library. Another excellent reference, which is written for nonspecialists, is Bruce Hendler's *Caring for the Land: Environmental Principles for Site Design and Review*.¹³ This report blends both environmental and site planning considerations into one site design manual.

¹² Joseph DeChiara and Lee Koppleman, *Urban Planning and Design Criteria*, 3rd ed. (Van Nostrand Reinhold Company, Inc., New York, 1982).

¹³ Bruce Hendler, *Caring for the Land: Environmental Principles for Site Design and Review*, PAS Report #328 (ASPO, Chicago, 1977).

3 ARMY INSTALLATION MASTER PLANNING

History

Army master planning has a unique history, obviously because of the specialized function which the military serves. U.S. military planning has traditionally centered on being prepared for the defense of the nation if it is engaged in hostile conflict. This goal is the basis for all other military plans. Thus, master planning has traditionally focused on military preparedness and the ability to meet the installation's mission statement.

The construction of permanent facilities to house and train U.S. Army troops is a 20th-century development. In earlier military conflicts (including the American Revolution, the War of 1812, the Mexican War, and the Civil War), small state militia were assembled and immediately dispatched to the field. Training, if any, was conducted there. Arms and ammunition were supplied by private foundries and smithies in the 18th century and by private manufacturers (such as DuPont, Colt, Remington, and Winchester) in the 19th century. It was not until WWI that any major construction of military installations began (with the development of 16 Army and 16 National Guard cantonments in 1917 by the Army Quartermaster Corps).

In the American Revolution, the Continental Congress (following British and Colonial practice) assigned the work of building bridges, roads, and fortifications to the Corps of Engineers and the task of quartering troops to the Quartermaster General. This division of responsibilities led to the latter taking responsibility for the construction of the WWI cantonments. Because such mass construction for rapid deployment was generally not within the expertise of the Quartermaster Corps, there were a number of protests, from Corps of Engineers officers and others, that the Corps of Engineers was much better equipped to do the construction.

Given the lull in American military activity between the wars (1920-1938), there was little construction of military facilities in that period. However, the largest U.S. military construction project for mobilization of troops (and thus modern Army master planning) began with the advent of WWII. Realizing the massive undertaking required to fulfill their requirements, the Army assigned construction of all Army Air Corps installations to the Corps of Engineers in November 1940. All Army construction was subsequently transferred to the Corps in December 1941. The recognition of the complexity of modern military facilities, and the subsequent need to carefully plan for and develop them, was the cornerstone on which modern Army master planning would be built.

The Corps has continued to support military construction on both Army and Air Force installations (primarily the former) since WWII. The installations have also developed an expertise for inhouse engineering and construction work through the Directorates of Engineering and Housing (DEHs). Army master planning officially became a permanent Army mission on 11 June 1946, with the approval and publication of AR 210-20, *Master Planning for Army Installations*. That regulation specifies that the Installation Commander is responsible for the preparation of installation master plans. The Commander must establish an installation planning board, which provides recommendations on installation master planning activities. The Commander must also forward the installation's master planning documents with an appropriate cover letter to the appropriate MACOM. An information copy of that cover letter should be sent to Headquarters, Department of the Army (HQDA), ATTN: CEEC-EI. Army installation master planning is conducted through the installation's DEH.

AR 210-20 has been revised 10 times since 1946, the latest revision being in July 1987. It is a responsive document, reflecting the unique needs and changing conditions of today's Army installations. The alternatives discussed in this report were chosen within the context of this regulation.

Uniqueness of Army Master Planning

Master planning on Army installations differs from its civilian counterpart in a number of ways. The principal issue in civilian land use planning is the balance between the public's health, safety, and welfare and the individual owner's private property rights. Although there may be proprietary interests held by competing installation offices, there are no private property interests on the military installation. The public (installation residents and employees) both protects its general welfare and controls the property ownership. Such a dual role presents a tremendous opportunity for enlightened and effective decisionmaking on the base. The ability to objectively consider and weigh both sides, coupled with the authority to enact a final decision, should create an environment in which long-range planning is an integral part of the decision-making process. The legal questions of due process, equal protection, and just compensation become questions of rationality, effectiveness, and efficiency. Successfully accomplishing the installation's mission statement and enhancing the quality of life for its residents and employees are the paramount concerns. However, there should be a note of caution that, when dealing with land use issues that affect the surrounding communities, the question of protecting private property rights should be of utmost concern to the installation decisionmakers.

Each installation may have its own standard operating procedure for reviewing land use siting decisions. There are no standardized Army procedures or requirements which must be met before approving each decision. This could lead to a wide variance in the scope of factors considered, the relative weight of each, and the means in which they are addressed. It is a "trial and error" process, with a great risk of error. Given the ambiguities and number of possibly conflicting specialized requirements in installation land development regulations, it is not surprising that there are installation-unique planning processes. Further, each installation has a different physical and political environment in which it is planning. A proposed standard land use planning process must recognize the individuality at each of these installations, and yet also bring a measure of uniformity in the land use siting decisions at them all.

Scope of Army Master Planning

The terms "master planning" and "comprehensive land use planning" have been used interchangeably throughout this study, although technically they are not synonymous. To reiterate the distinction, master planning covers all facilities, programs, and resources that aid installation management and development. Land use planning is a central element of installation master planning, but it is not the only one. Important land use planning considerations include:

- The relationship of the installation's land uses to those of the surrounding region.
- The necessary allocation, proper arrangement, and efficient correlation of land uses and structures to serve the mission and strength of the installation

- Suitability of existing streets, structures, utilities, transportation facilities, and recreation facilities
- Future expansion requirements.

Army master planning must include all land areas and facilities that are under Army jurisdiction, whether owned or leased, or on- or offpost. Examples of such areas would include land leased for training purposes or housing constructed in the community by the Army. Offpost activities conducted by the Army which affect onpost land use considerations are also considered. The installation master planners should also estimate and project the ability of the surrounding civilian community or communities to provide services for the installation personnel. Deficiencies in local services will require the Army to make up the difference for its personnel, or, conversely, the community may have unique services which the installation cannot provide. Further, installation master planners should consider how onpost activities are affecting the surrounding communities (e.g., through such programs as the Installation Compatible Use Zone [ICUZ]). Direct political action by the local residents (or through Congressional pressure) as a means of complaining about installation activities could be detrimental to the installation's ability to perform its mission.

The installation master plan should be an executive summary of the resources available to the installation, its goals and objectives for future growth and development, and the means needed to apply the resources to achieve the desired goals and objectives.

Goals of an Installation Master Plan

The master plan (MP) serves a number of purposes, including:

- Ensuring that facilities are provided for the support of the installation's long-range mission statement's goals and objectives (comprehensive, compatible land use planning)
- Providing an official statement of the installation's long-range operations
- Seeking the highest quality of life reasonably possible for the installation's residents and employees
- Ensuring the most efficient and effective allocation of natural and built resources to meet the above goals
- Protecting the installation's natural environment.

These broad concerns are by no means separate and unique goals. They are inseparably interwoven, with each directly affecting the others. They are separated here simply for ease of discussion.

In discussing all of these master planning goals it should be remembered that there is more than one set of installation residents and/or employees to be considered when planning the installation's facilities and land uses. Current residents and employees are working towards meeting the installation's current mission statement. However, future residents may be working towards a revised or even completely different mission statement. *It is this forecasting in the face of uncertainty which makes master planning*

different from a common-sense approach to problem solving. It is an art which must consider the past, present, and especially the future.

Comprehensive, Compatible Land Development

The fundamental concern of installation master planning is to see that adequate facilities are provided to meet the installation's mission statement. These facilities would probably include, at the least, administration, troop housing, training areas, family housing, and related support and maintenance areas. Land use should be arranged to best serve the installation's mission statement. Land use planning is simply spatially arranging human activities in facilities created to serve or support those activities.

The essence of land use planning is the process of ensuring comprehensive, compatible land development. This process has four essential objectives, discussed in the following sections.

Separating Incompatible Uses. Incompatibilities between two land uses usually occur because one or both has certain characteristics or creates certain effects that range from annoyances to public health and safety threats to users of the other area. Examples include the inconvenience of having two major traffic generators next to each other on a tertiary street, the smallest defined street in the Army street hierarchy (see Technical Manual [TM] 5-822-2)¹⁴ with both having 8:00 to 5:00 work shifts. Examples of threats to public health and safety could include residential uses underneath flight zones or any development on poor soils, steep slopes, etc. In some instances, mitigation measures can be taken to lessen the negative impact of one use to the other (e.g., noise attenuation measures for residential uses in aviation or industrial areas). But these after-the-fact measures will almost always be more expensive than preventing of the incompatibilities in the first place. This is an important point: the cost and effort of comprehensive land use planning may appear to be an extra burden, but it almost certainly will be less expensive than the sprawl¹⁵ and subsequent corrective measures taken against it, that are needed in the absence of comprehensive planning.

Combining Related Uses. This approach is the principal means of preventing the potential of sprawl on an installation. Most facilities and land uses require supporting facilities, utilities, and transportation systems. The more functionally arranged those land uses and facilities are, the more efficient use they can make of their support systems. A good analogy is a car pool, where a number of people share the same resource (a car), instead of each providing their own. This planning objective requires the planner to identify existing and proposed support facilities, utilities, and transportation systems and to identify the relative need for each proposed land use.

Providing Adequate Support Infrastructure and Utilities. U.S. Army, Europe (USAREUR) has a number of excellent space and planning criteria (discussed in Chapter 4) to help master planners assess the support needs of a wide range of land uses.¹⁶

¹⁴Technical Manual (TM) 5-822-2, *General Provisions and Geometric Designs for Roads, Streets, Walks and Open Storage Areas* (Department of the Army [DA], 14 July 1987).

¹⁵For an explanation of "sprawl" see *The Costs of Sprawl: Detailed Costs Analysis* (Real Estate Research Corporation [for Council on Environmental Quality, Department of Housing and Urban Development, and U.S. Environmental Protection Agency], Washington, DC, 1974).

¹⁶*Space and Planning Criteria Manual* (U.S. Army, Europe [USAREUR], New York, 1983).

Based on such criteria, planners should determine what infrastructure and utilities are available for the proposed uses and what the most economical means will be to extend new services, if needed. Of all land development, the extension of infrastructure (especially streets and sidewalks) and utilities has the most lasting effect on the long-term development of the installation.

Estimating Environmental Condition. Planners must determine whether the proposed development sites can accommodate the proposed use without environmental degradation or excessive maintenance. If there are major environmental problems from developing the site, it is likely that those problems will negatively affect the proposed use. At the very least, it would be an uneconomical use of a limited natural resource under the Army's stewardship.

Official Statement of Long-Range Operations

AR 210-20 sets the installation master plan in the larger context of Army planning as follows.

The MP responds to the Army Planning System while incorporating many existing Army programs. Army planning is based on threat assessment, broad strategy, and plans extending beyond the five year programming time frame. Army planning establishes objective force levels for the Army and provides a point of departure and target for programming. ...An installation MP belongs to and is a statement from each Army Installation. An MP increases the installation commander's authority by making a projection into the future based on clearly established command goals and mission objectives. While an MP responds to the plans and programs of higher headquarters, and others, it remains primarily a response by the installation to these influences.¹⁷

The installation master plan provides a direction for the short- and long-range development of the Army community and installation (AR 210-20, par. 4-1 [a]). According to this AR, it is also the guide for preparing the 5-year plan and other construction, renovation, and replacement programs (par. 4-1 [f]). Master planning also ensures that installation projects are sited to meet operational, safety, and environmental requirements (par. 4-1 [g]). The master plan coordinates the many policies of an installation into a comprehensive package. As such, it is a framework for relating the installation mission statement to plans for facilities, programs, projects, and policies that are required to support the installation (par. 4-1 [d]). The master plan relates the Army's assets and needs with the social, cultural, and economic systems of the surrounding civilian community or communities (par. 4-1 [e]). The economic/social benefits and consequences of an installation are often quite significant to the host community: in many instances the installation is its largest employer, and housing, retail, and social services provided by the community are an integral part of meeting the installation's personnel needs.

Quality of Life

This term refers to the many essentials and amenities which affect the standard of living for the installation residents. For this discussion, these issues are defined as those which directly affect the residents' ability to live and work on the installation. When

¹⁷ AR 210-20, par. 1-4 (a).

comprehensive planning is used to determine the best possible arrangement of facilities to serve human activities, this arrangement should also, by design, maximize the quality of life for the residents and employees (through maximizing the use of those facilities). In addition to facilities, human service planning is a basic requirement of maintaining and protecting the installation's residents and/or employees quality of life. This type of planning includes providing medical, recreational, and educational programs for the installation residents and/or workers.

Health, safety, and welfare are terms which are often used to describe basic quality of life concerns. These concerns include providing clean water, utilities, and sewage disposal; providing protection from fire, flood, and crime; and organizing passive and active recreational activities. There are two basic approaches to providing these facilities. The first, a practical approach, is that care should be taken to meet all the services necessary to sustain healthy and reasonably (within realistic costs) comfortable home and office environments. The purpose of this approach is to arrange land uses which depend on, or which support, each other. For example, residential uses depend on a number of supporting uses, such as roads, utilities, sewers, police and fire protection, schools, libraries, etc. The second approach, a proscriptive one, is that the installation residents should be protected from the negative aspects of land uses which can be found on an installation (such as aircraft and blast noise, hazardous traffic conditions, etc.). It seeks to separate, or at least mitigate the impact of, land uses which may adversely affect each other. Examples could include removing training and airfield uses from the residential or recreational areas. The emphasis is on the actual effects produced by the undesirable land use and how those effects hinder or prevent the accomplishment of desirable activities. Both approaches are important in securing an environment which allows the installation residents and employees to best perform the duties and activities which are expected of them.

Maximum Efficiency and Effectiveness of Development

This goal is the natural extension of the previous three goals: supporting the installation mission statement, providing an official statement, and seeking the highest possible quality of life. This fourth goal is the main point of most of the suggestions being made in this report. The process of drafting, improving, and following an installation master plan is a basic requirement for this objective. Master planning is the primary means of coordinating the many varied installation land use rules and regulations, preventing many potential conflicts and overlaps of land uses. A comprehensive planning program encourages the most efficient development of the installation over time. The master plan provides a way to maintain a consistent, installation-wide siting policy as commanders rotate every 2 years. The master plan can encourage efficient and effective development through identifying the installation's "focal uses" (discussed in Chapter 5) and planning accessory uses to accommodate those focal uses. This prioritization scheme allows the installation decisionmakers to put development money into those proposed projects which will have the most effect for the least cost; that is, they can obtain a maximum effect for a minimum investment. This is very important since economic planning has become a necessity in the effort to match growing fiscal demands with tightening Federal dollars. Planners must consider means of minimizing the cost of providing services to the installation and means of providing revenue other than direct public funding (e.g., nonappropriated-funds [NAF] community facilities).

Protection of Natural Environment

It is important for planners to map out the installation's environmental "carrying capacity."¹⁸ Areas which are unsuitable or which should be protected from development should be clearly delineated. Care should be taken to conserve developable land, paying attention to the placing and timing of new land uses. When necessary, environmental impact analyses or statements should be prepared to ensure that development does not harm the natural environment. Or, if some harm is created, mitigation measures must be taken. The ultimate objective of protecting the installation's natural environment is to incorporate the built (man-made) environment into the natural in a manner that best accommodates both environments. There should be a natural balance of man working with, not against, his natural environment.

Energy conservation is also a very important strategic planning tool. Dependence on imported foreign fossil fuels is of great concern to our national defense. Alternatives which use renewable resources, such as solar, wind, water, or thermal energy sources should be encouraged. These alternatives include the orientation of facilities to maximize the use of solar power and/or minimize unwanted solar gain in the summer, and the placement of functionally related uses to minimize travel distances between them.

Ecological/environmental factors are vital to ensuring that the installation's natural resources are carefully managed and conserved. Army environmental regulations also require strict compliance with Federal laws such as the NEPA. Given the limited land available to each installation, it is of fundamental importance that the Army be a good steward of that land.

¹⁸ McHarg; Godschalk.

4 ARMY PLANNING REGULATIONS

Army master planning under AR 210-20 is a major factor in the growth and development of an Army installation. But by no means is it the only, or perhaps even the major, factor. Other processes which have a direct impact are the Planning, Programming, and Budgeting System (PPBS), contained in AR 1-1;¹³ the Military Construction, Army (MCA) series (AR 415s); the real estate series (AR 405s); and the now-rescinded Department of Defense (DOD) *Construction Criteria* (DOD 4270.1-M, which included AR 415-2 and DA Circular 415-84-1). A number of technical manuals and reports also provide detailed technical assistance (along with the online PAX real estate criteria tables and the 1391 Processor).

AR 1-1, or PPBS, is one of the most important Army regulations. It regulates the process whereby funds are requested, allocated, and spent for all Army projects, including installation development. Without this process, the Army would cease to function. Generally speaking, the MCA process (AR 415-15) is the means through which installation development is programmed into the PPBS process.

Funding and Approval Requirements

A twisted trail of funding authority and approval leads from the PPBS long-range planning and policy decisionmaking to the installation projects. As described in AR 1-1, it begins with the Office of the Secretary of Defense (OSD) and continues through to the Joint Chiefs of Staff (JCS). From there, decisions are passed on to the Department of the Army (DA) and eventually on to the installations (via their MACOMS). That trail is followed at least three times in the creation of any given year's approved budget: once each for planning, programming, and budgeting. When budgeting, approval must be gained from the U.S. Congress, thus adding another element of uncertainty. To outline that process in detail would be confusing, but a general description is useful. Greatly simplified, the OSD prepares an annual Five Year Defense Program (FYDP), that is based on previous JCS analyses of long-range strategic military planning. That FYDP is then sent to the Army Select Committee (SELCOM), which consists of senior Army staff. The SELCOM prepares a Program Objective Memorandum (POM) (which is also 5 years long). That POM becomes the basis for HQDA'S annual Program and Budget Guidance (PBG). The PBG is sent to the MACOMS, from which they develop their Five Year Programs (FYP) (revised annually). That MACOM FYP is a guiding document for installation development planning in the MCA process. As stated in AR 415-15:

MCA appropriations provide funds to meet specific Army requirements for major and minor construction as described in this regulation. Such requirements are listed in the Five Year Defense Program (FYDP) as part of the DOD Programming System. The FYDP is designed to provide a construction program that is consistent with current Army stationing plans, resources, and budget objectives. The FYDP provides the basis for the more detailed Program and Budget Guidance (PBG) that outlines the missions and levels of activities to major Army commands (MACOMS) and

¹³AR 1-1, *Planning, Programming, and Budgeting Within the Department of the Army* (HQDA, 9 July 1986).

agencies. MACOM commanders, in turn, prescribe strengths and missions to subordinate installations and activities, based on the PBG.²⁰

It is HQDA policy, including the FYDP, that establishes the context within which installation master plans are developed. The installation's mission statement is the specific task required of it to meet the Army's overall strategic goals. The master plan should guide installation growth and development so that the mission statement is efficiently and effectively met. Once the master plan has been established, future policy guidance, including the FYDP, must be adopted in a manner that is consistent with that master plan. Paragraph 3-2 of AR 415-15 states: "Proposed construction projects must be a part of the installation master plan approved by HQDA (DAEN-ECE-I) [now CEEC-EI]. (See AR 210-20)... ." ²¹ Further explanation of how the installation's master plan is to be considered is given in paragraph 9-3, which states that: "Proposed projects to be located on a permanent installation with a HQDA (DAEN-ECE-I) approved General Site Plan (AR 210-20), will be shown by annotating a xerographic copy of the approved General Site Plan... ." ²²

The recent revision to Army master planning does not specifically require a "General Site Plan" (which was the central document for the previous version). However, there is a similar requirement in the "future development plan drawings" section of the master plan's "future development plan component" (see the following section on AR 210-20). The new requirement is simply called a "site plan," which (from AR 210-20): "shows the recommended siting of all proposed facilities required to accomplish the mission of the installation. ...All proposed construction, including major facility engineering projects that have an impact on land use, will be shown on the plan regardless of the source of the construction funds... ." ²³

AR 210-20, Master Planning for Army Installations

As discussed in the previous chapter, AR 210-20 is the regulation governing master planning on Army installations. A comparison and contrast study of the most recent revision (July 1987) with its predecessor is difficult, given that the revised regulation is completely reworded and reformatted. The new version also incorporates language and ideas from AR 210-23, Section II of AR 415-36, and TB ENG 354, thus rescinding those documents. As stated in the latest revision, "Because the structure of the entire revised text has been reorganized, no attempt has been made to highlight changes from the earlier regulation dated 26 January 1976." Rather than do a detailed analysis, this chapter will address the substantive issues of this regulation, emphasizing major changes and new requirements.

AR 210-20 is the fundamental source of authority and guidance for master planning on Army installations. (Other significant regulations and related documents are covered in the following section.) This regulation:

...prescribes policies, responsibilities, and procedures for the Army Installation Master Planning Program and for development, maintenance,

²⁰ AR 415-15, *Military Construction, Army (MCA) Program Development* (HQDA, 1 December 1983), par. 1-4b.

²¹ AR 415-15, par. 3-2.

²² AR 415-15, par. 9-3.

²³ AR 210-20, par. 4-7d (4).

and approval of Army installation master plans consonant with the concept of comprehensive planning. It also establishes the requirement for a planning board and various documents that comprise a master plan.²⁴

The regulation is divided into six sections and three appendices, with Sections 3, "Comprehensive Planning," and 4, "Master Plan," being the central elements.

Required Documents

Army master planning involves developing and organizing many component plans and documents into one master plan. AR 210-20 lists 16 categories of these plans and documents (asterisks indicate the most significant sections):²⁵

- Natural resources plan
- Environmental protection plan
- Installation layout and vicinity*
- Land use plan*
- Airfield, air, and range operations
- ICUZ study
- Utilities plan*
- Communications plan
- Transportation plan*
- Energy plan
- Guidelines
- Landscape development plan
- Future development plan*
- Fire and life safety protection plan
- Physical security
- Quality of life programs.

Most, but not all, of those plans and documents must be completed by the installation:

The installation, in coordination with the MACOM, will determine which component plans will be synopsized or referenced in the master plan

²⁴ AR 210-20, par. 1-1.

²⁵ AR 210-20, par. 3-3.

narrative. Most of the component plans listed below are normally required; however k, l, and p [installation design guidelines, landscape development plan, and quality of life programs] are optional unless required by other regulations and directives or dictated by local conditions.²⁶

The most fundamental change in the new AR 210-20 master plan is the removal of the previous "general site plan" in favor of a number of specialized current and future development plans. As seen above, current plans include land use, transportation, and utilities.

Of all the categories listed above, the future development plans have become the focal point of master planning in this new version. These plans contain the following four important subelements:

- A facility use survey
- Tabulation of existing and required facilities
- Future development plan drawings
- A master plan narrative.

The facility use survey is an inventory of the existing uses (supply) of the installation's facilities. The tabulation of existing and required facilities is a tabulation of the installation's needs for facilities (demand), for both immediate and projected needs. Future development plan drawings are graphic estimates reflecting the final product of the future development planning process and depend on the previous studies conducted. These future development drawings include:

- A regional plan
- Airfield plans
- Installation land use plans
- A site plan
- A transportation plan
- Utilities and storm drainage plans.

All future proposed construction will have to be shown on the site plan.

The master plan narrative is the executive statement of the installation planning process: it is the basis for the future development plan drawings discussed above. The latest version of AR 210-20 contains a number of new requirements concerning this narrative. Those requirements include:

- An installation profile
- A requirements analysis

²⁶AR 210-20, par. 3-3.

- A land use analysis
- A description of functional relationships
- A list of development goals and objectives
- A description of master proposals
- A summary of existing conditions
- An environmental assessment
- A development of concepts.

Of those new requirements, the "development of concepts" section has potentially the most impact on long-range master planning at Army installations. This concept plan should be a planning tool to assist installation planners in mapping out the installation's development over 15 to 20 years. Given this purpose, the concept plan could be described as a supported statement of the installation's long-range direction, in graphic and narrative forms. "Ideal functional configuration/relationship models and diagrams should be developed and used to provide a yardstick for examining alternative planning concepts."²⁷ Conceptual development is a systematic process of applying planning principles in which planners:

1. Identify the installation's problems, goals, and objectives, as derived from the installation mission statement
2. Analyze those identified problems, goals, and objectives to produce specific development objectives
3. Propose an ideal set of solutions which will meet those development objectives.

Changes

The installation master plan is not a static document. It should be maintained and revised to reflect changing conditions. AR 210-20 requires all master plan documents to be updated every 5 years, unless the MACOM waives this requirement under certain circumstances. Although the plan must be updated, the changes should reflect actual conditions and not be arbitrarily changed to create those new conditions. As stated in Paragraph 5-2, "Maintenance and Revision": "Installation plans, programs, and projects will follow the approved master plan, unless there are strong reasons to justify a conceptual change to installation development (for example, a mission change or a new operational concept)."²⁸ Paragraph 5-2 goes on to specify that the master plan should be updated, no matter what the time frame, if one or more of the following changes occurs:

- Significant changes in assigned strength
- Changes in the installation mission that may trigger the need for a different conceptual development

²⁷ AR 210-20, par. 4-7 (f).

²⁸ AR 210-20, par. 5-2.

- Operational safety requirements affecting offpost land use
- Changes in the character, type, or conditions of existing installation land use
- Changes affecting the master plan's accuracy and clarity
- Amendment requested by the MACOM.

Although not specifically stated in paragraph 5-2, apparently it is the responsibility of the installation master planner to initiate updates when one of these conditions exists.

Other Regulations

There are five major topical AR series directly related to Army master planning: 200, "environmental quality"; 210, "installations"; 405, "real estate"; 415, "construction"; and 420, "facilities engineering"; which contain a total of 83 regulations among them. Two major technical manual series (5-800 and 5-803) contain 14 manuals that are also directly relevant to Army master planning. While not every one of the regulations in those series applies to installation master planning, there are still a great number, with at least one pertinent regulation in each series (see Chapter 4 and Appendix B).

These related regulations create a marked division of master planning processes. Community planners, civil engineers, architects, landscape architects, real property managers, and installation commanders each have their own unique perspective of how the installation should be developed, based on each person's role in the planning process. With specific mandates from each of their respective ARs and a lack of strong interdisciplinary coordination, master planning breaks down into a number of independent, unrelated activities.

Installation land development is principally governed and regulated by the AR 415 series (Military Construction). Specifically, the installation land development processes required in program development (AR 415-15), design approval (AR 415-20),²⁹ and implementation (AR 415-10)³⁰ are the fundamental means of proposing, approving, and building new development on an installation. AR 210-20 master planning is only integrated by reference into this "415" construction budgeting/programming process. Appendix B cites the appropriate cross references from those 415 regulations. Unfortunately, these references lack the mechanism for practical implementation of installation master planning. Installation decisionmakers must consider the master plan, but there is no guidance on what, when, or how to consider it. In effect, it would appear that, in many cases, master planning is limited to photocopying an existing installation land use map and then "fitting" in (wherever there is enough space) proposed new land uses. Note that such a broad generalization is of limited use because of the diversity in each installation's master planning.

Perhaps the most significant other regulation guiding land use decisions was DOD 4270.1-M, *Construction Criteria*. The status of those criteria is currently undetermined. The Army is now operating under the interim guidelines of the Chief of Engineer's "Architectural and Engineering Instructions: Design Criteria," which is similar in

²⁹ AR 415-20, *Project Development and Design Approval* (HQDA, 28 March 1974).

³⁰ AR 415-10, *Military Construction—General* (HQDA, 1 March 1984).

many respects to DOD 4270.1-M. The principal difficulty with the cookbook approach used by these regulations is the wide discrepancy in the level and quality of technical information for the various topics. These publications are handy reference guides, but are neither organized nor complete enough to use as an umbrella organizational guide.

Another important reference for Army master planning is Technical Manual (TM) 5-803-1, *Installation Master Planning Principles and Procedures*, which "sets forth master planning principles and procedures for sound planning and economical development of an Army installation."³¹ This TM is the principal technical guidance specifically for master planning. It was recently revised, but the new version was not available for review in this study.

A much better source of detailed information on site planning is TM 5-803-5, *Installation Design*. The manual is broken down into four parts: general, design guidelines, prototype areas, and appendices (which include very good reference and annotated bibliography sections). As stated in the manual, it is "a tool to improve the appearance and functioning of military installations by enhancing natural site assets; compatibility relating the natural and built environments; establishing a circulation and open space system; achieving a consistent architectural character; and coordinating site components such as lighting, signing, and street furniture to reduce clutter."³² The bulk of the text covers the design guidelines, which are well organized and illustrated.

An excellent source for active Army installation-wide space and planning criteria is USAREUR's *Space and Planning Criteria* (parts of which have been incorporated into the Army's online Programming, Analysis, and Execution (PAX) system's Real Estate Criteria Tables). Although the criteria were created for the European installations, it appears they would also apply to Continental United States (CONUS) installations (with the exception of two additional digits for several of the category codes to denote unique USAREUR requirements). The manual is divided into three sections: introduction, space and planning criteria, and appendices. The space and planning criteria are set out for land uses that are organized by their category codes (AR 415-28³³). The criteria include:

- Internal functional elements
- Required inputs
- Planning factors
- Real estate and land use requirements
- Special instruction
- Additional references.

As stated in the manual:

This manual provides USAREUR planners with space and planning criteria defining facility allowances. It contains a great deal of general and, in

³¹ TM 5-803-1, *Installation Master Planning* (DA, 13 June 1986), par. 1.

³² TM 5-803-5, *Installation Design* (DA, 1981), par. 1-1 (c).

³³ AR 415-28, *Department of the Army Facility Classes and Construction Categories (Category Codes)* (HQDA, 1 November 1981).

many instances, specific criteria for various facility classes and construction categories. It is intended as a general source book of criteria, thus the user may need to reference other listed technical manuals, regulations, and design guidelines which provide more detailed information.³⁴

Appendices of particular interest include a matrix of internal functional relationships, a supportive requirements matrix, a real estate requirements and land use matrix, and an environmental impact matrix. The matrices are very good organizers of the basic issues to be considered in the land use siting process. The real estate requirements and the land use matrix have been incorporated in the Army's online PAX Army Criteria Training System.

An exhaustive analysis of the USAREUR criteria's applicability to CONUS installations was not conducted. However, it is felt that the level of detail found in the majority of the categories is sufficiently broad to allow its use by those installations. Furthermore, the matrices are not site-specific at all and would be excellent tools in conducting land use siting decisions.

³⁴*Space and Planning Criteria Manual, Introduction.*

5 A PROPOSED LAND USE PLANNING PROCESS

This chapter is a synthesis of the preceding chapters. Theories, techniques, and tools reviewed and discussed in the previous three chapters will be incorporated into a proposed land use planning process.

Choosing the proposed recommendations in this chapter was a process of elimination. At the outset of this report, performance zoning was considered the best choice for the objectives to be achieved (see Appendix A for reasons). In setting up hypothetical examples of how this police power regulation (see Chapter 2) would work on an Army installation, it was determined that the specific standards would achieve the objective but that the administration of police power land use regulations would be a costly and ineffective implementation process.

That conclusion was based on the fact that the legal environment for which police power regulations were created differs from that found at Army installations. The civilian environment is based on private property ownership with clearly marked property lines and a give-and-take relationship between private profit and protection of the public's interest. The intent of these civilian regulations is to protect the public's health, safety, and welfare, while minimizing the negative effects to private property owners. These standards are based on the assumption that there are clearly divisible property rights (lot lines and other ownership rights) that can be regulated.

It is not necessary to implement such an elaborate system when all the property is owned and held by a public agency for the public good (such as a military installation). Without a public versus private conflict (because there are no individual property rights), public comprehensive land use planning without a private property enforcement mechanism is the most effective approach. However, there remains a need to have planning and site design standards to implement that comprehensive land use planning.

The theories and techniques given in Chapter 2, including planned unit developments (PUDs), transfer of development rights (TDRs), environmental carrying capacity, land use intensity, developmental impact, and Lynch's site planning were used as concepts which should be addressed in the proposed process. Although the specific mechanisms are not mentioned in most cases, the objectives were incorporated into the overall intent of the comprehensive land use planning process. The review in Chapter 2 provides an understanding of the goals to be attained through planning and the means through which they can be accomplished. The proposed system loosely follows Chapin's five basic elements of a land use planning program (from Chapter 2):

1. The plan for planning: determination of basic parameters
2. Building the information base
3. Problem analysis and goal specification
4. Advance formulation of policies/plans; and
5. Action planning: real-time participation in current problem solving and impact assessment.

Again, this is a conceptual framework: Chapin's ideas were not literally followed step for step; rather they were an organizational structure upon which the proposed process could be developed.

The proposed system was developed by combining the research conducted for Chapters 2, 3, and 4 with expert judgment. Extensive interaction with the project sponsor and interviews with other Army master planning experts on existing procedures and references assisted in the verification of this report's approach and conclusions.

There are three phases in the proposed process: (1) gathering preliminary information, (2) preparing a conceptual development plan, and (3) siting land uses in conformance with the conceptual development plan.

Gathering Preliminary Information

The emphasis of this activity is on creating a data base upon which land use siting decisions may be made. The first step toward such a data base is collecting or developing a number of installation information maps. The most important map is one depicting current land uses on the installation. Activities shown should fall into one of the five-digit classification labels for Army land uses (AR 415-28). The map should cover all facilities, all supporting infrastructure, all land which has been adapted to accommodate land uses (any cut and fill, drainageways, road beds etc.), and all undeveloped areas. Areas used for training should be clearly marked on the map, with the training type designated. A street map which includes traffic counts from the Military Traffic Management Command's traffic engineering study should be readily available. Major differences in the size or condition of each street should be clearly shown.

Those installations which have conducted an ICUZ study should include the contour maps for both blast and fixed/rotary wing aircraft noise. This noise is the installation's potentially most damaging effect upon land uses, both on- and offbase. Those installations which have not conducted an ICUZ study should do so. Noise impacts, both present and those estimated for the future, will be a fundamental determinant of future growth and development on and around the installation.

All current and proposed utilities, water mains, sanitary sewer lines, and solid waste disposal facilities should be shown on their respective maps.

Appropriate environmental thematic maps should be prepared. These maps should include the following factors: topography, hydrography, vegetation, the 100-year flood plain (shown on U.S. flood insurance rate maps), soils (for many counties, shown on U. S. Soil Conservation Service Maps), steep slopes, identification of endangered flora and fauna species, prevailing winds and solar angles, and any unusual microclimates.

Extensive guidance for Army installations on collecting environmental data and preparing appropriate base maps is available online through the Environmental Technical Information System (ETIS).^{*} State-of-the-art environmental information is also available from researchers at USA-CERL who have prepared several computerized data

^{*}Information on ETIS can be obtained from the Program Director, ETIS Support Center, Urbana, IL; telephone (217) 333-1369.

bases, including stand-alone systems such as the Geographic Resources Analysis Support System (GRASS).*

Mission and Demographic Analysis

After having prepared the base studies and information maps, the installation master planners should add in programmatic and demographic factors. Those factors should include:

- An analysis of the installation's mission statement (this analysis should estimate the expected demand for facilities and other land uses generated by that statement and what effect any predicted mission statement changes would have on that total demand).
- The current and predicted assigned installation mission strength based on the Table of Organizational Elements (TOE) and the Table of Distribution and Allowances (TDA) (this information is classified and should not be inadvertently released to the public).
- All current and proposed MCA projects and nonappropriated community housing projects (the 5-year development plan should be included with this information).
- A demographic analysis of the installation broken down by age, race, sex, assignment, and family status (this analysis should include projected trends of the installation's demographic composition).

Estimating and Forecasting

Having completed these basic studies and analyses, the master planners should now do some basic estimating and forecasting, based on the preliminary information collected or developed. These estimates should answer the following questions:

- What are the installation's primary functional land uses (those which are fundamentally essential to the installation and which require specific locations on the installation)?
- What are the deficiencies (if any) in current primary or support-to-primary uses, given the strength assigned to the installation by its current and forecasted mission statements?
- Are there any current land uses which interfere with or impede the current or proposed primary or support-to-primary uses?
- Do any of the proposed construction development programs address the problems identified in the above two questions?

Through these questions the planners assess the installation's current resources and plan for the necessary land use changes to remedy any shortcomings. In essence, this

*Information on GRASS can be obtained from Bill Goran or Jim Westervelt, Environmental Division, USA-CERL; telephone 1-800-USA-CERL outside Illinois, 1-800-252-7122 inside Illinois.

approach is a carefully planned, comprehensive, rational evaluation. Through carefully considering all the pertinent factors and the important questions, planners are better prepared to make the best suggestions for the installation's future development.

Preparing a Conceptual Development Plan

The conceptual development plan is being proposed as a means of structurally organizing the Army installation land use planning process. It is a means of guiding long-range planning over 15 to 20 years. That guidance, as proposed in this report, includes basic planning and design guidelines for choosing between alternative sites for a proposed land use and for designing the location and arrangement of land uses at a given site. The procedure described below is the key element in this proposed planning process. The preparation of the conceptual development plan should follow four simple steps:

1. Establish location of primary uses (through conducting preliminary data collection and analysis).
2. Assign 1 of 12 land use areas (from USAREUR space and planning criteria) to land use areas surrounding focal points.
3. Plan for the additional supporting facilities (structures), utilities (services), and infrastructure (other permanent improvements) required to meet future land use demands generated by the installation mission statement (as reflected by the master planning studies).
4. Prepare an official map, that (a) shows all existing and proposed land uses, streets, and utilities and (b) protects environmentally or culturally significant areas.

Primary Uses

The first step establishes the location of primary uses. For this report, a primary use is one that is essential to fulfilling the installation's mission statement (or potential future mission statements). It must provide a specific function towards meeting that statement, and not merely be an accessory or supporting use for another use (e.g., a garage that is an accessory to a residence). These primary uses may each require a certain location(s) on the installation to best serve their respective functions.³⁵ In locating and scheduling this development, strategic and operational factors should be considered, as well as other factors expressed in the mission statement or installation master plan. These uses should be sited based on the preliminary information gathering and analysis conducted at the outset of the planning process. The focal uses should be identified with one of the 12 land use areas contained in USAREUR's *Space and Planning Criteria Manual* (as discussed in the following step). In placing primary uses, care should be taken to also identify any accessory uses which are necessary to support those primary uses (e.g., parking, recreation, drainage etc.). When locating primary uses, future primary uses, either proposed or potential, should also be considered.

³⁵TM 5-803-1, par. 6.

Land Use Areas

The second step assigns 1 of 12 land use areas (from the PAX/USAREUR space and planning criteria) to the areas surrounding the focal uses. Those land use areas are:

- Administration
- Ammunition storage
- Aviation
- Community support
- Equipment and maintenance
- Family housing
- Medical
- Recreation
- Services (utilities)
- Supply and warehousing
- Training
- Troop housing.

The boundaries for these land use areas should be based on one or more of the following factors, as deemed appropriate by the installation master planner:

- Master plan designation
- An area of land affected by one or more characteristics of the focal use (e.g., noise or smoke generated, open space required, etc.)
- Natural or manmade boundaries (e.g., rivers, steep slopes, or roads, barriers, etc.).

The presence or absence of supporting facilities and utilities should be considered when designating the type and size of a land use area. The siting of accessory (support-to-primary) uses in the land use area should be based on their compatibility with the primary use(s) within that area. Incompatibilities may be inherent in the uses or may just be operational or strategic in nature, thus allowing mitigation factors to be introduced. All land uses proposed for future development at an installation should be assigned to one of the three-digit classification codes for that use (AR 415-28). Three-digit codification is necessary for future real property management requirements.

At this point, it should be noted that this proposal to create land use areas is similar, but not equivalent, to zoning. This proposal is better compared to the land use designations on a civilian city comprehensive plan map. Zoning is a system whereby land uses are permitted, conditionally permitted, or not permitted within a certain district (see discussion on zoning in Appendix A). The proposed land use areas would not have

zoning restrictions, other than restricting the siting of adjacent incompatible uses (as determined by a compatibility matrix) and meeting the required space and planning criteria. As discussed in Appendix A, it is the difficulty of administering zoning regulations that led to the recommendation that zoning not be adopted on Army installations.

Supporting Facilities

The third step in preparing the conceptual development plan is to plan supporting facilities/uses, utilities, and infrastructure. Supporting or accessory uses should be placed around their respective primary use. Circulation, utility, sewage, and solid waste disposal systems should then be planned so as to best facilitate the use of these primary use groups. The installation master planner(s) should estimate needed changes in streets and utilities to support changes in land uses. This estimate is based on information gathered earlier in the planning process and should reflect the estimated difference in current capacity and future demand.

Streets should be marked by a hierarchy of use. The Army's hierarchy for streets is (from largest/most used to smallest/least used): primary, secondary, tertiary, and post (see TM 5-822-2). The streets' dimensions and placement will depend on their functions. Primary streets should be reserved for through traffic, including all business (heavy/large/loud) vehicles. Secondary streets should be designated as the transition between residential neighborhoods and the arterial streets (residential neighborhoods should not contain arterial streets and/or heavy traffic). Tertiary streets should serve only local commuter traffic, and should be designed to discourage through traffic. These streets are often the center of pedestrian and playground activity, so the safety of pedestrians and children should be paramount.

Because many utilities and sewers are often sited under or near these streets, the utility support system should also be considered. These streets should facilitate quick drainage of storm water. The use of barrier curbs, roll curbs, or swales should be determined by the type of land uses and the amount of drainage along the roads. Onstreet parking should only be encouraged on residential streets. TM 5-822-2 contains explicit, minutely detailed specifications for nearly all possible street engineering considerations. Utilities should be sited to points of greatest (or expected future) demand. Leap-frog development of utilities (bypassing unused areas which have all necessary utilities in place to serve remote developments which do not) should be discouraged. When possible, these utilities should be placed where easy repairs can be effected. The right-of-way along street pavements is often the most efficient choice. Placement along rear lot lines (in this case, land use areas) should be discouraged unless there is clear access to those utilities (clear access means no interference with the surrounding land uses). Placement directly under paved streetways should also be discouraged (it is very expensive to rip up the street every time a repair is needed). When utilities and sewers share the same trough, care should be taken to adequately separate them.

The addition or extension of infrastructure to meet the expected demand should be placed and timed so that there is a minimum of expenditure. An important means of minimizing cost is arranging proposed land developments so that new construction of streets or utilities is reduced or delayed and that current facilities are not taxed beyond their ability to effectively serve the proposed changes. If necessary, the master planner should propose changes to established MCA or nonappropriated construction programs to conform to the conceptual plan. Phasing, sequence, and timing are also important aspects; future development should be planned so that facilities are grouped together

when possible and that new development occurs as near as possible to existing facilities and utilities.

Official Map

The fourth and last step in preparing a conceptual development plan is preparing an official map. This map is intended to be a graphic representation of the conceptual development planning process called for by AR 210-20. This map should project the ideal arrangement of the installation's natural and manmade resources by designating the best future location of the installation's land uses. This map would be a guiding document to be followed unless changing conditions warrant otherwise. In other words, while the plan should not be binding in strict detail, there would have to be sufficient evidence, with corresponding documentation, that changing conditions warranted an amendment to that plan.³⁶ The official map should incorporate the findings of the previously conducted master planning studies and analyses and should fall within Army program and design guidelines. The map should show all current and proposed land use areas (from one of the 12 PAX/USAREUR land use areas). Primary uses should be mapped first. It should also show all current and proposed utility, water, and sewer lines and all streets and sidewalks.

The map of the conceptual development plan should become the official siting guide when judging future land use proposals at the installation. Thus, it becomes the focal point of the planning process, the standard against which decisions should be made. This official map, as well as all other master planning documents, should be reviewed and approved by the Installation Planning Board (IPB) and the appropriate MACOM. A cover letter should be included in the materials sent to the MACOM, with an information copy of that letter sent to HQDA (CEEC-EI).³⁷ Once approved at all these levels, the official map becomes the basis against which all new proposed development is evaluated. With that in mind, this study now turns to the implementation of the conceptual land use plan that has been developed as described above.

Siting Land Uses in Conformance With the Conceptual Development Plan

This section explains a proposed land use siting review, amendment, and approval process which is modeled after typical civilian processes. The intent of this process is to link the information and guidance contained in the conceptual development plan with the land use siting decisions being made at the installation. Furthermore, it is intended to integrate the relevant Army land use planning regulations. The proposed process would be conducted through IPB meetings, open to all installation personnel who would be affected by the proposed change. If appropriate, locally elected civilian officials should also be invited to attend, if there is an issue which would significantly affect surrounding communities. DOD Directive 4165.61 (included in AR 210-70)³⁸ requires this local interaction:

The military installation master plan...shall be offered upon approval by the Military Department concerned. Significant changes to the installation

³⁶ AR 210-20, par. 5-2.

³⁷ AR 210-20, par. 5-1 (a).

³⁸ AR 210-70, *Intergovernmental Coordination of DOD Federal Development Programs and Activities* (HQDA, 1984).

master plan shall also be submitted for review. The intent of the review is to allow local officials to evaluate the impact of land and facility use on their own development plans.

If the installation commander can show that an open discussion would adversely affect national security, the IPB meetings would be closed. In no case would there be a modification to the official plan without prior review and recommendation by the IPB.

The process has three important phases. First, the proponent's office (the office proposing a new land use), through the Directorate of Engineering and Housing (DEH), provides documented reasons why the request should be granted. Second, the IPB determines land use impact and conformance with the conceptual development plan. Third, the installation commander and the MACOM reviewers approve the plan.

Proposal

When an installation office proposes a new facility or land use for the installation's 5-year plan (see previous discussion on master planning and the PPBS system), it asks the installation DEH to provide a clear written statement, supported by graphic representations, to substantiate that request. That statement must include the following items:

- A site plan, drawn to scale, which shows all existing and proposed improvements to the site.
- A statement of purpose and timetable for completion of the proposed project.
- Cost estimates for the proposal, including costs of no action or deferred action.
- The location of the proposal, including all land uses within 250 ft and other significant functional relationships.
- Estimated space and infrastructure demands (see the USAREUR space and planning criteria, including the internal functional relationships matrix and supportive requirements matrix).
- Physical site characteristics, including any environmental constraints (both impediments to construction and areas in need of protection; see USAREUR environmental attributes matrix).
- Estimated compatibility with surrounding uses, based on the USAREUR real estate requirements matrix.

Impact Analysis

After the proponent office has presented the above information, the IPB determines the impact of that proposal on the installation. It is the installation master planner's responsibility to prepare a technical analysis for each proposal. The IPB should consider the impacts on the:

- Installation's natural environment, existing infrastructure, and residents (environmental impact does not necessarily mean an Environmental Impact Assessment [EA] or Environmental Impact Statement [EIS], but if one has been done it should be included; impact to infrastructure should be measured in

additional demand generated [trips per day, gallons per minute, etc.]; and impact to residents should include both conveniences and annoyances generated by the new use).

- Installation's mission statement (how the proposed use fulfills a mission statement need and potential adverse affects to the mission statement).
- Economy and social institutions, both on- and offbase (jobs generated, dollars spent, taxes levied, whether additional social services are required [new people in the community will need social services]).
- Installation's utility, communication, circulation, and waste disposal demands.
- Legal and/or other intergovernmental requirements.

Official Review

In the third and final phase, the commanding general should review the proposed changes and the IPB's recommendation(s) before approving or disapproving the proposed land use. In making that decision, the commanding general should provide a written record stating the reasons for the decision. The entire public record should then be forwarded to the MACOM reviewers for their concurrence.

This three-phase procedure should also be followed for general amendments to the conceptual development plan. Such amendments would include those necessitated by major changes to the installation's 5-year plan (through the annual update) or a change in the installation's mission statement.

Once this planning process has been developed and initiated at an installation, and upon successful completion of the conceptual development plan, the installation commander should be given the authority to have the final word on siting decisions which have been reviewed and approved through that process. AR 420-10 permits this delegation of authority:³⁹

MACOM Commanders have responsibility for final technical review and approval of drawings, plans, and related technical documents of projects within their approved authority. They may delegate part or all of this authority to subordinate Commanders with redelegation authority as desired. However, subordinate organizations must have the technical review capability before being delegated such authority.

The MACOM would then only receive notices of actions taken and would not have to approve those actions before they may begin. If the MACOM reviewers felt that the siting decision did not conform to the established process, they could then ask for further clarification and take appropriate steps as necessary to correct the problem(s).

The process outlined above is a framework for a land use planning process. Installation master planners will need to familiarize themselves with, and incorporate, the reference sources which have been reviewed here (e.g., AR 210-20, TM 5-803-1, the eventual successor to DOD Manual 4270.1-M, and the USAREUR space and planning criteria).

³⁹ AR 420-10, *Management of Installation Directorates of Engineering and Housing* (HQDA, 1984), par. 3-3 (a).

6 CONCLUSIONS AND RECOMMENDATIONS

This report presented a master planning process that incorporates existing requirements, including recent revisions to Army master planning. This process is based on a review of the literature on master planning methods and an analysis of Army installation master planning policies.

Conclusions

- The diversity of regulations and standard operating procedures creates confusion in the adoption and implementation of a standard master planning process at Army installations (Chapter 4).
- The principal means of addressing that confusion is through the creation of a systematic comprehensive master planning process which identifies and integrates the many facets of land use planning/management into a unified approach (Chapter 5).
- There are theories, techniques, and tools available to update and streamline the process (Chapters 2, 3, and 4)
- The new requirement (under AR 210-20) of an installation conceptual development plan provides a unique opportunity to initiate the changes suggested in this report (Chapter 5).

Chapter 5 proposed a planning process which emphasizes comprehensive land use planning, rather than zoning or other available techniques. The key element would be the conceptual development plan (now required by AR 210-20), which would take its final form as an "official map." A public review and comment process would accompany any later siting decisions involving the plan, allowing affected parties to express their opinions. Ideally, given an acceptable installation concept plan and review process, the MACOM would delegate approval to the installation commanding general. Chapters 2, 3, and 4 provided the background necessary to develop the planning process proposed in Chapter 5.

Recommendations

Three principal recommendations are made in this report:

1. Create a standard installation land use planning process, incorporating recent revisions to AR 210-20 and replacing conflicting or obsolete standards with state-of-the-art planning techniques.

This recommendation is not as drastic as it may appear. The reasoning behind this suggestion is to simply organize the existing rules, regulations, and policies (as proposed in Chapter 5) into one comprehensive process. It is not a totally new process; rather it is streamlining of the existing installations' land use planning processes. As proposed, it also seeks to incorporate the recent revisions to AR 210-20, specifically the new requirement for a conceptual development plan. The proposed comment and review process (adapted from civilian procedures) should also be reflected in the other AR series related to master planning (e.g., 200, 210, 405, 415, and 420).

It is felt that there are several state-of-the-art planning techniques, such as USAREUR's space and planning criteria (which have been adopted in the online PAX Army Criteria Training System) and aspects of the civilian land use planning process, which are appropriate for adoption by Army installations. The intent is to identify those existing standards which may be outdated or in conflict with each other, and then to propose resolutions to those problems.

2. Assemble references from the many related AR's and guidance documents into one users' guide, to be used as a single reference for installation master planners and MACOM reviewers.

This point of reference would be a user's guide to assist in either discovering what other approval processes must be followed while implementing the master plan, or, conversely, seeing what master planning requirements must be followed when pursuing another approval process. The user's guide would be oriented towards both the installation master planners, who prepare and implement the master plan, and the MACOM reviewers, who must approve those decisions. The guide would list the applicable documents in a numerical index (following the current Army numerical/subject classification system), give the appropriate citation (if any), and would include a brief synopsis of the citation's intent. The list of regulations in Appendix B is a first step toward such a guide.

3. At some future time, codify the related AR's into a subject-indexed code that reflects that standard land use planning process. The research conducted for this report would be a good starting point for such efforts.

CITED REFERENCES

- Army Regulation (AR) 1-1, *Planning, Programming, and Budgeting Within the Department of the Army* (Headquarters, Department of the Army [HQDA], 9 July 1986).
- AR 210-20, *Master Planning for Army Installations* (HQDA, 12 June 1987).
- AR 210-70, *Intergovernmental Coordination of DOD Federal Development Programs and Activities* (HQDA, 1984).
- AR 415-10, *Military Construction—General* (HQDA, 1 March 1984).
- AR 415-15, *Military Construction, Army (MCA) Program Development* (HQDA, 1 December 1983).
- AR 415-20, *Project Development and Design Approval* (HQDA, 28 March 1974).
- AR 415-28, *Department of the Army Facility Classes and Construction Categories (Category Codes)* (HQDA, 1 November 1981).
- AR 420-10, *Management of Installation Directorates of Engineering and Housing* (HQDA, 2 July 1987).
- Chapin, F. Stuart, and Edward J. Kaiser, *Urban Land Use Planning* (University of Illinois Press, Urbana, IL, 1979).
- The Costs of Sprawl: Detailed Costs Analysis* (Real Estate Research Corporation [for Council on Environmental Quality, Department of Housing and Urban Development, and U.S. Environmental Protection Agency], Washington DC, 1974).
- Department of Defense (DOD) 4270.1-M, *Construction Criteria* (DOD, 15 December 1983); rescinded.
- DeChiara, Joseph, and Lee Koppleman, *Urban Planning and Design Criteria*, 3rd ed. (Van Nostrand Reinhold Company, Inc., New York, 1982).
- Godschalk, David R., Francis H. Parker, and Thomas R. Knoche, *Carrying Capacity: A Basis for Coastal Planning?* (Department of City and Regional Planning, University of North Carolina, Chapel Hill, NC, 1974).
- Hendler, Bruce, *Caring for the Land: Environmental Principles for Site Design and Review*, Planner's Advisory Service (PAS) Report #328 (American Society of Planning Officials [ASPO], Chicago, 1977).
- Interim Planning Framework* (Headquarters, U.S. Air Force, Washington, DC, 1984).
- Kendig, Lane, Susan Conner, Cranston Byrd, and Judy Heyman, *Performance Zoning* (American Planning Association [APA] Planner's Press, Chicago, 1980).
- Lynch, Kevin, and Gary Hack, *Site Planning*, 3rd ed. (MIT Press, Cambridge, MA, 1984).
- McHarg, Ian L., *Design With Nature* (The Natural History Press, Garden City, NY, 1969).

Meshenberg, Michael J., *The Language of Zoning: A Glossary of Words and Phrases*, PAS Report #322 (ASPO, Chicago, 1976).

A Model Land Development Code (The American Law Institute, Philadelphia, 1975).

Nieswand, George, and Peter Pizor, *Current Planning Capacity: A Practical Carrying-Capacity Approach to Land-Use Planning*, Extension Bulletin #413 (Rutgers University, New Brunswick, NJ, undated).

Space and Planning Criteria Manual (U.S. Army, Europe, New York, 1983).

Standard City Planning Enabling Act (U.S. Department of Commerce, Washington, DC, 1928).

Standard State Zoning Enabling Act (U.S. Department of Commerce, Washington, DC, 1926 rev. ed.).

Technical Manual (TM) 5-803-1, *Installation Master Planning* (Department of the Army [DA], 13 June 1986).

TM 5-803-5, *Installation Design* (DA, 1981).

TM 5-822-2, *General Provisions and Geometric Designs for Roads, Streets, Walks and Open Storage Areas* (DA, 14 July 1987).

UNCITED REFERENCES

Anderson, Robert M., and Bruce B. Roswig, *Planning, Zoning, and Subdivision: A Summary of Statutory Law in the 50 States* (New York State Federation of Official Planning Organizations, Albany, NY, 1966).

Bair Jr., Fred H., and Ernest R. Bartley, *The Text of A Model Zoning Ordinance*, 3rd ed. (American Society of Planning Officials [ASPO], Chicago, 1966).

Bair, Frederick H., *Intensity Zoning: Regulating Townhouses, Apartments, and Planned Unit Developments*, PAS Report #416 (ASPO, Chicago, 1976).

Barrows, Richard L, *The Roles of Federal, State and Local Governments in Land-Use Planning*, NFA Report #197 (National Planning Association, Washington, DC, 1982).

Basile, Ralph J. (ed.), "Carrying Capacity," *Environmental Comment*, December 1987.

Beardslee, Clarence G., "Development of Army Camp Planning," *Civil Engineering*, Vol 12, No. 9 (1942), pp 489-492.

Brubaker, Sterling (ed.), *Rethinking the Federal Lands* (Resources for the Future, Inc., Washington, DC, 1984).

- Chavooshian, B. Budd, George H. Nieswand, and Thomas Norman, *Growth Management Program: A Proposed New Approach To Local Planning and Zoning*, Leaflet #503 (Rutgers University, New Brunswick, NJ, undated).
- Clark, Philip H., "Base Comprehensive Planning: Leading the Air Force into the 21st Century," *The Military Engineer*, November/December 1985, pp 586-589.
- Clawson, Marion, *The Federal Lands Revisited* (Resources for the Future, Inc., Washington, DC, 1983).
- Fine, Leonore, and Jesse A. Remington, *The Corps of Engineers: Construction in the United States* (Headquarters, Department of the Army [HQDA], Washington, DC, 1972).
- Franks, Michael J., "Performance Zoning: How it's Doing in the Place Where it Began," *Planning*, December 1982, pp 21-23.
- Goodman, William I., and Eric C. Freund (eds.), *Principles and Practices of Urban Planning*, 4th ed. (International City Management [ICMA], Washington, DC, 1968).
- Greenburg, Froda, and Jim Hecimovich, *Traffic Impact Analysis*, PAS Report #387 (APA, Chicago, 1984).
- Harrison, Jr., Hunter C., and John A. Lynch, *Federal Land Use Policy* (American Enterprise Institute for Public Policy Research, Washington, DC, 1975).
- Hedman, Richard, and Andrew Jasewski, *Fundamentals of Urban Design* (Planners Press, Chicago, 1984).
- The History of the US Army Corps of Engineers* (U.S. Army Corps of Engineers, HQDA, Washington, DC, 1986).
- Hough, Michael, *City Form and Natural Process: Towards a New Urban Vernacular* (Croom Helm, London, 1984).
- Kaminsky, Jacob, *Environmental Characteristics Planning: An Alternative Approach to Physical Planning* (Regional Planning Council, Baltimore, MD, 1972).
- Kendig, Lane, "The Bucks County Technique is Slowly Catching On," *Planning*, December 1982, p 24.
- Kendig, Lane H., "Developers and Performance Zoning," *Urban Land*, January 1982, pp 18-21.
- Land-Use Intensity* (interim ed.), Land Planning Bulletin #7 (U. S. Department of Housing and Urban Development, Washington, DC, 1966).
- Laserre, F., and H. P. Oberlander, *A Study of Performance Standards For Space and Site Planning for Residential Development* (Unpublished, DBR Internal Report #273).
- Lustig, Morton, et al., *Standards for Housing In Suburban Communities Based Upon Zoning for Work* (Government Study Center, The Fels Center of Government, University of Pennsylvania, Philadelphia, 1972).

- Lynch, Kevin, *A Theory of Good City Form* (MIT Press, Cambridge, MA, 1981).
- Manual: Design and Control of Land In Suburban Communities* (The Institute of Rational Design, Inc., New York, 1975).
- McDougal, Luther L., "Performance Standards: A Viable Alternative to Euclidean Zoning?" *Tulane Law Review*, Vol 47, No. 2 (1973), pp 255-283.
- McElroy, Joseph J., "You Don't Have To Be Big To Like Performance Zoning," *Planning*, May 1985, pp 16-19.
- Model Zoning Ordinance* (Indiana Planning Services Agency, Indianapolis, IN, 1976).
- Nadler, Gerald, *The Planning and Design Approach* (John Wiley and Sons, New York, 1981).
- Odum, Howard, and Ann Odum, *Energy Basis for Man and Nature* (McGraw-Hill Book Company, New York, 1976).
- Pease, James R., and Michael Morgan, "Performance Zoning Comes to Oregon," *Planning*, August 1980.
- Performance Zoning* (Bucks County Planning Commission, Bucks County, PA, 1973).
- Phalen, Tam, "How Has Performance Zoning Performed?" *Urban Land*, October 1983, pp 16-21.
- Raup, Philip M., *The Federal Dynamic in Land Use*, NPA Report #180 (National Planning Association [NPA], Washington, DC, 1980).
- Residential Site Development Advisory Document* (CMHC, Quebec, Canada, undated).
- Roddewig, Richard J., and Cheryl A. Inghram, *Transferable Development Rights Programs*, PAS Report #401 (APA, Chicago, 1987).
- Rubenstein, Harvey M., *A Guide to Site Planning and Environmental Planning*, 2nd ed. (John Wiley and Sons, New York, 1980).
- Schneider, Devon M., et al., *The Carrying Capacity Concept as a Planning Tool*, PAS Report #338 (ASPO, Chicago, 1978).
- Schultz, Marilyn S., and Vivian L. Kasen, *Encyclopedia of Community and Environmental Planning* (Facts On File Publications, New York, 1984).
- Site Planning Criteria* (Canadian Municipal Housing Corporation [CMHC], Quebec, Canada, 1977).
- A Site Planning Evaluation Methodology: Task A Report* (Llewelyn-Davies Associates, Department of Housing and Urban Development, 1974).
- Smith, Herbert H., *The Citizen's Guide to Zoning* (APA Planner's Press, Chicago, 1983).

So, Frank, Israel Stollman, and Frank Beal (eds.), *The Practice of Local Government Planning* (ICMA, Washington, DC, 1979).

Technical Manual for Installation Site Planning (Proposed) (EDAW Associates [for U.S. Army Engineer Division, Huntsville], Atlanta, GA, 1983).

Thurow, Charles, William Toner, and Duncan Erly, *Performance Controls for Sensitive Lands: A Practical Guide for Local Administrators*, PAS Report #307 and #308 (ASPO, Chicago, 1975).

Wolfe, M. R., and R. D. Shinn, *Urban Design Within The Comprehensive Planning Process* (University of Washington, Seattle, WA, 1970).

Zach, Leon M., "Site Planning of Cantonment and Community Housing," *Civil Engineering*, August 1945, pp 363-366.

ABBREVIATIONS AND ACRONYMS

AFR	Air Force Regulation
AR	Army Regulation
ATC	Air Traffic Control
BIS	Building Information Schedule
CONUS	Continental United States
DA	Department of the Army
DEH	Directorate of Engineering and Housing
DOD	Department of Defense
d.u.	dwelling units
EA	Environmental Impact Assessment
EIS	Environment Impact Statement
ETIS	Environmental Technical Information Service
f.a.r.	<i>floor area ratio = total sq ft of all buildings/total sq ft of site</i>
FORSCOM	Forces Command
FYDP	Five Year Defense Program
FYP	Five Year Programs
GRASS	Geographic Resources Analysis Support System
HPP	Historic Preservation Plan
HQDA	Headquarters, Department of the Army
ICUZ	Installation Compatible Use Zone
IPB	Installation Planning Board
IPF	Installation Planning Framework
i.s.r.	<i>impervious surface ratio = total acres covered by impermeable surfaces/total acres at site</i>
JCS	Joint Chiefs of Staff
MACOM	Major Command

MCA	Military Construction, Army
MP	Master Plan
MTMC	Military Traffic Management Command
NAF	nonappropriated funds
NAVAID	Air Navigational Aids
NEPA	National Environmental Policy Act
NGR	National Guard Regulation
OSD	Office of the Secretary of Defense
o.s.r.	open space ratio = total acres in open space/total acres at site
PAX	Programming, Analysis, and Execution
PBG	Program and Budget Guidance
POM	Program Objective Memorandum
PPBS	Planning, Programming, and Budgeting System
PUD	planned unit development
RPF	real property facility
SELCOM	Army Select Committee
SPEA	Standard City Planning Enabling Act
SZEA	Standard State Zoning Enabling Act
TDA	Table of Distribution and Allowances
TDR	transfer of development rights
TM	Technical Manual
TOE	Table of Organizational Elements
USACC	U.S. Army Communications Command
USA-CERL	U.S. Army Construction Engineering Research Laboratory
USAF	U.S. Air Force
USAREUR	U.S. Army, Europe
USEPA	U.S. Environmental Protection Agency

APPENDIX A: OTHER PLANNING PROCESSES CONSIDERED

Zoning

At the outset of this study, it was felt that performance zoning (discussed in Chapter 2) would be particularly appropriate for the Army MACOM installations, given its unique flexibility to adapt to a variety of different natural and manmade environments.

However, as research and discussion on this project continued, the proposed scheme raised a number of potential problems and conflicts and it became increasingly clear that performance zoning specifically, and zoning generally, would not work at Army MACOM installations, for the following reasons.

A police power regulatory approach (the imposition of minimum or maximum standard requirements as a prerequisite to approval of a land development) is not seen as appropriate for actions which can be more efficiently and effectively dealt with through administrative implementation (a comprehensive land use planning process). Thus, most of the traditional civilian regulatory systems (notably zoning, subdivision, and their derivatives) are not seen as appropriate for use in a military (administrative) setting. Many of the standards, while necessary to define the parameters of a regulatory system, would become arbitrary and would not achieve a significant effect in relation to the effort expended on them (e.g., floor area ratio, open space ratio, minimum lot size, etc.). It is proposed that the most effective approach would be one which clarifies the functional relationship between land uses, patterns of circulation, and utilities, and which estimates the compatibility between land uses and between each use and the environment. It should be pointed out that several of the regulatory systems (including performance zoning) contain many of the same concepts and ideas as the proposed system. It is only the regulatory implementation approach which is not recommended.

As a system which separates uses into similar functional classes (e.g., residential or industrial) and then does not permit two different functional uses in the same district, zoning does not address the need for better site planning at the MACOM installations. First, an installation is a composite entity which is planned as a unit, considering all the functional land use relationships necessary to support all the uses. It would serve no useful purpose to separate interrelated uses into separate districts simply because they may have different functions (a common criticism of civilian zoning). Second, this approach is only a very broad preventive approach aimed at prohibiting potentially incompatible development. It does not provide any guidance on what the preferred land use arrangement at a given site should be (site planning). Because performance zoning addresses those two concerns, an intensive study was made of the possibility of adopting it at MACOM installations. However, as discussed below, even this alternative does not appear to be the best means of solving the installations' land use planning needs.

The detail required by performance standards (including the designation of intensity classes and subsequent bufferyard requirements) often cannot be achieved without excessive operational costs which are not justified by the marginal (if any) improvement in the siting process. Often the standards are used to control adverse impacts from individual land owners who would not otherwise control those impacts. Because the Army owns all the land on the installation, it is compelled to control adverse land use impacts. This is the most rational means of protecting the installation's residents, employees, and limited resources.

U.S. Air Force Interim Planning Framework (IPF)

This study also reviewed other military land use planning programs. Of particular interest was the U.S. Air Force's (USAF's) interim land use framework.⁴¹ The USAF has a requirement for an IPF (a land use plan with accompanying documents), which all of its installations must meet. The planning process appears to be well thought out and a major step forward in military land use planning. As stated in the IPF Guidelines:

The plan is designed to support the siting and programming of facilities by providing the necessary guidance for future base development. It is based on an analysis of the various factors that influence base development, including utility distribution, airfield criteria and environmental factors, and correlates land use, transportation and environmental planning with specific project sitings and facility requirements. These interim plans provide the foundation for Land Use and Transportation components of the Base Comprehensive Plan (AFR [Air Force Regulation] 86-4).

Originally, the researchers considered recommending that the Army adopt a similar program for its MACOM installations. However, with the July 1987 revision of AR 210-20, the researchers feel that the Army's planning needs will be better met through adopting a comprehensive land use planning process that enforces and implements the newly required conceptual development plan. There are a number of similarities between the two programs, but the concept plan is more detailed, more comprehensive in scope, and longer-range. Thus, it would have been redundant to require both an IPF and a conceptual development plan for Army installations.

⁴¹ *Interim Planning Framework* (Headquarters, U.S. Air Force, Washington, DC, 1984).

APPENDIX B:

ARMY REGULATIONS RELEVANT TO MASTER PLANNING, WITH EXCERPTED CITATIONS

55 SERIES - TRANSPORTATION AND TRAVEL

55-80 HIGHWAYS FOR NATIONAL DEFENSE

(1-16)(F): "All major Army commands will inform the Commander, MTMC [Military Traffic Management Command], of changes at military installations that will greatly affect the following: ... (2) Travel Flow conditions on installation roads. MTMC will review the plans for new or modified transportation and traffic generating facilities and advise of potential adverse impact."

95 SERIES - AVIATION

95-9 TERMINAL AIR NAVIGATION AND AIR TRAFFIC CONTROL FACILITIES

(1-5)(d): "USACC [U.S. Army Communications Command] subordinate commands having responsibility for operating and maintaining ATC [Air Traffic Control] and NAVAID [Air Navigational Aids] facilities will - Ensure that planning and construction programming of ATC and NAVAID facilities conforms to requirements: (a) AR 210-20 for installation master planning; (b) AR 415-15 for Military Construction, Army (MCA) projects; and (c) AR 415-35 for minor construction projects."

200 SERIES - ENVIRONMENTAL QUALITY

200-1 ENVIRONMENTAL PROTECTION AND ENHANCEMENT

200-2 ENVIRONMENTAL EFFECTS OF ARMY ACTIONS

"Relevant environmental documents, comments, and responses accompany the proposal through the existing Army review and decision-making process. Integrate NEPA requirements with other planning and review procedures required by law or Army practice so review of environmental considerations is concurrent, rather than consecutive."

210 SERIES - INSTALLATIONS

210-10 ADMINISTRATION

210-15 ACTIVATION, INACTIVATION, OR CHANGE IN STATUS OF INSTALLATIONS

210-20 MASTER PLANNING FOR ARMY INSTALLATIONS

"This regulation...explains the concept of comprehensive planning and establishes policies, procedures, and responsibilities for implementing the Army Installation Master Planning Program."

**210-23 MASTER PLANNING FOR ARMY INSTALLATIONS: EMERGENCY
EXPANSION CAPABILITY (superseded by revised AR 210-20)**

210-50 FAMILY HOUSING MANAGEMENT

(6-22): "For master planning, see AR 210-20. The installation housing manager will take part in the master planning of housing projects and related facilities on the installation. As such, the housing manager should be a member of the installation master planning board."

**210-70 INTERGOVERNMENTAL COORDINATION OF DOD FEDERAL
DEVELOPMENT PROGRAM AND ACTIVITIES**

(DOD Directive #4165.61, encl. 4, C, 1): "The military installation master plan...shall be offered upon approval by the Military Department concerned. Significant changes to the installation master plan shall also be submitted for review. The intent of the review is to allow local officials to evaluate the impact of land and facility use on their own development plans. It will also help the review of later annual construction and real property acquisition and disposal projects."

405 SERIES - REAL ESTATE

405-10 ACQUISITION OF REAL PROPERTY AND INTERESTS THEREIN

Apparently there is no formal cross-reference between this document on acquiring property with any planning regulations.

405-45 INVENTORY OF ARMY MILITARY REAL PROPERTY

(1-1): "This central inventory [of military real property] is a basic source of information on status, cost, capacity, condition, use, maintenance, and management of the real property overall and by individual installations. It will be used as the basis for the annual publication entitled "Inventory of Army Military Real Property, for the Building Information Schedule (BIS) as required by AR 210-20... ."

405-70 UTILIZATION OF REAL ESTATE

(1-3)(d): "Real Estate not needed to support current requirements or to meet future requirements in accordance with master planning (AR 210-20), and requirements of the Reserve Component forces will be reported for excessing in accordance with AR 405-90."

(1-7)(a): "Each Installation Commander will make an annual real property utilization of each assigned installation, subinstallation, or facility by 31 March of each year... .

(b) The survey report will be developed along the following outline: ... (5) Provide total land data: [including] Existing land uses. Show acreage by functional area, e.g., airfield, housing, recreational areas and field training. [and] Proposed future land uses (approved master plans, when available) (AR 210-20)... . (6) Prepare separate reservation land use maps of a size to allow ease in handling, in accordance with instructions contained in paragraph 2-2a(5) AR 210-20."

405-90 DISPOSAL OF REAL ESTATE

(1-3)(d): "Real Estate not needed to support current requirements or to meet future requirements in accordance with master planning (AR 210-20), ...will be reported for excessing in accordance with 405-90."

(1-7)(b)(6): "Prepare separate reservation land use maps of a size to allow ease in handling in accordance with instructions contained in paragraph 2-2a(5), AR 210-20."

(2-3)(b)(5): "Inspection and control procedures established herein are designed to achieve the following specific objectives: ... Coordination of facility space use with both installation long-range master planning and mobilization planning requirements."

AR 415 SERIES - CONSTRUCTION

415-13 MILITARY CONSTRUCTION, ARMY PROGRAM: DISPOSAL OF STRUCTURES

(3)(c)(2): "Installation Commanders will keep the installation master plans up to date."

415-15 MILITARY CONSTRUCTION, ARMY (MCA) PROGRAM DEVELOPMENT

(3-2): "Proposed construction projects must be a part of the installation master plan approved by HQDA (DAEN-ECE-I)."

415-19 NONAPPROPRIATED-FUNDED CONSTRUCTION PROJECT DEVELOPMENT AND APPROVAL

(7)(C): "All facilities proposed to be constructed with NAF shall be sited according to the DA approved installation master plan (AR 210-20)."

415-20 PROJECT DEVELOPMENT AND DESIGN APPROVAL

(5)(b)(1): "For a proposed facility to be sited in accordance with DA approved master plan documents, a copy of the General Site Plan (as referred to in AR 415-15), annotated to show the location of the proposed primary facility and related supporting facilities will be furnished to the OCE [Office of the Chief of Engineers]."

415-35 MINOR CONSTRUCTION

(3-2): "Advance Planning includes tasks essential to project development and is to be funded from the OMA [Operation and Maintenance] account. It includes such functions as - ... (b) Developing the installation master plan. (c) Performing alternative site studies... (f) Preparing environmental impact assessments and statements."

420 SERIES - FACILITIES ENGINEERING

420-10 FACILITIES ENGINEERING: GENERAL PROVISIONS, ORGANIZATION, FUNCTIONS, AND PERSONNEL

(1-4)(b)(3): "The planned use of a RPF [Real Property Facility] will be reflected in the installation master plan and real property records. Level of maintenance and repair will be compatible with the facility's planned use."

(2-2) (f): "The DEH will...be a voting member of the Installation Planning Board and serves as the executive secretary of the Board providing master plans."

(g)(1)(d): "Ensure each newly constructed rehabilitated facility meets those standards used or recognized by the [now rescinded] DOD 4270.1-M."

(3-3): "MACOM commanders have responsibility for final technical review and approval of drawings, plans, and related technical documents of projects within their approved authority. They may delegate part or all this authority to subordinate commanders with redelegation authority as desired. However, subordinate organizations must have the technical review capability before being delegated such authority."

420-40 HISTORIC PRESERVATION

(1-4)(e)(6): "Installation Commanders...will - See that the HPP [Historic Preservation Plan] and projects are coordinated with master planning (AR 210-20 and NGR [National Guard Regulation] 415-5), environmental analysis (AR 200-2), and natural resources management plans (AR 420-74)."

420-70 BUILDINGS AND STRUCTURES

(1-12)(a)(I): "Real property buildings may be relocated when the proposed site conforms with the Installation Master Plan... ."

(2-1)(d): "[DA] policy contemplates programmed replacement of nonpermanent type buildings or structures with permanent type facilities. Planned schedules of replacement to meet these requirements will be made in accordance with AR 210-20, AR 415-15, and AR 415-13."

420-72 SURFACED AREAS, RAILROADS, AND ASSOCIATED STRUCTURES

(2-11): "Minor construction projects of roads, airfields, and other surfaced areas, appurtenances, and associated structures accomplished as a Facilities Engineering Activity will conform to the Master Plan for the installation (AR 210-20)."

ENS Team Distribution

HQFORSCOM 30330-0000
ATTN: FCEN-CDP-M

Chief of Engineers
ATTN: DAEN-ZCF-U
ATTN: CEEC-M (2)
ATTN: CEEC-ZA

US Army Engineer District
New York 10278
ATTN: Chief, Design Br.
Pittsburgh 15222
ATTN: Chief, Engr Div
Philadelphia 19106
ATTN: Chief, NAPEN-E
Baltimore 21203
ATTN: Chief, Engr Div
Norfolk 23510
ATTN: Chief, NAOEN-R
Huntington 25721
ATTN: Chief, ORHED-P
Wilmington
ATTN: Chief, SAWEN-PP 28401
ATTN: Chief, SAWEN-PM 28401
ATTN: Chief, SAWPD-E 28402
Charleston 29402
ATTN: Chief, Engr Div
Savannah 31402
ATTN: Chief, SASAS-L
Jacksonville 32232
ATTN: Env. Res. Br.
Mobile 36628
ATTN: CESAM-PD-ER/ME
Nashville 37202
ATTN: Chief, ORNED-P
Memphis 38103
ATTN: Chief, LMMED-PR
Vicksburg 39180
ATTN: Chief, Engr Div
Louisville 40201
ATTN: Chief, Engr Div
St. Paul 55101
ATTN: NCSPD-ER
Chicago 60604
ATTN: Chief, NCCPD-ER
ATTN: Chief, NCCPE-PES
St. Louis 63101
ATTN: Chief, ED-B
Kansas City 64106
ATTN: Chief, Engr Div
Omaha 68102
ATTN: Chief, Engr Div
Little Rock 72203
ATTN: Chief, Engr Div
Tulsa 74121
ATTN: SWTED
Fort Worth 76102
ATTN: Chief, SWFPL-R
ATTN: Chief, SWPED-F
Galveston 77553
ATTN: Chief, SWGAS-L
ATTN: Chief, SWGCO-M
Albuquerque 87103
ATTN: Chief, Engr Div
Los Angeles 90053
ATTN: Chief, SPLED-E
San Francisco 94105
ATTN: Chief, Engr Div
Sacramento 95814
ATTN: Chief, SPKED-D
Far East 96301
ATTN: POFED-L
Seattle 98124
ATTN: Chief, NPSEN-PL-WC
ATTN: Chief, NPSEN-PL-ER
ATTN: Chief, NPSEN-PL-BP
Walla Walla 99362
ATTN: Chief, Engr Div
Alaska 99506
ATTN: NPAEN-G-M

US Army Engineer Division
New England 02154
ATTN: Laboratory
ATTN: Chief, NEDED-E
Sou. Atlantic 30303
ATTN: Chief, SADEN-E

Huntsville 35807
ATTN: Chief, HNDED-CS
ATTN: Chief, HNDED-M
Lower Mississippi Valley 39180
ATTN: Chief, PD-R
Ohio River 45201
ATTN: Chief, Engr Div
North Central 60605
ATTN: Chief, Engr. Planning Br.
Southwestern 75242
ATTN: Chief, SWDCO-O
South Pacific 94966
ATTN: Laboratory
Pacific Ocean 96858
ATTN: Chief, Engr Div
ATTN: Chief, PODED-P
North Pacific
ATTN: Laboratory 97060
ATTN: Chief, Engr Div 97208

5th US Army 78234
ATTN: AKFB-LG-E

7th US Army 09407
ATTN: AETTM-DTT-MG-EH

172nd Infantry Brigade 98733
ATTN: AFZT-FG-EH

US Army Western Command 96858
ATTN: APRM-MC

USA ARRADCOM 07801
ATTN: DRDAR-LCA-OK

West Point, NY 10996
ATTN: Dept of Mechanics
ATTN: Library

Ft. Belvoir, VA 22060
ATTN: Learning Resources Center

Ft. Lee, VA 23801
ATTN: AMXMC-D (2)

Ft. McPherson, GA 30330
ATTN: AFEN-CD

Ft. Monroe, VA 23651
ATTN: ATEN-AD
ATTN: ATEN-FE-US

Aberdeen Proving Ground, MD 21010
ATTN: NGB-ARI-E

US Naval Oceanographic Office 39522
ATTN: Library

Kirtland AFB, NM 87117
ATTN: AFWL/NTE

Little Rock AFB 72099
ATTN: 314/DEEE

Tinker AFB, OK 73145
2854 ABG/DEEE

Building Research Board 20418

Dept. of Transportation
Tallahassee, FL 32301

Dept. of Transportation Library 20590

Transportation Research Board 20418

Defense Technical Info. Center 22314
ATTN: DDA (2)