

# **LAND USE PLANNING BULLETIN**

**Base Comprehensive Planning**

**HQ USAF/LEEVX**

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**Prepared by**

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## Credits

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# PREFACE

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## A. Purpose of Bulletin

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1. This bulletin provides guidance for Air Force civil engineering personnel responsible for land use planning, and for consulting firms that prepare land use plans. The bulletin explains the concept of land use planning and describes a process for developing, submitting for approval, implementing, and updating the land use plan component of base comprehensive plans (BCPs) under AFR 86-4. Suggested land use plan contents and a sample statement of work also are included. The bulletin applies to personnel, including US Air Force Reserve, at all Air Force installations, facilities, and activities. Any comments, recommendations, or proposed changes should be sent to HQ USAF/LEEV, Washington, DC 20332-5000.
2. The primary purpose of the BCP is to guide the development of an installation in a way that maximizes mission effectiveness, enhances the quality of life of Air Force personnel, and preserves the quality of the natural and human environments.
3. The base comprehensive plan contains three major sections. The first is a plan overview, which summarizes the BCP. The land use plan, with the other individual component plans, comprises the second section of the BCP. The third section is the capital improvement plan, which is the implementation tool for translating requirements into projects.

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## B. How to Use the Bulletin

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1. As both a guide to the land use planning process and a reference for base planners, the bulletin discusses the land uses at a base and describes the functional relationships among these uses. The bulletin also tells how to develop and maintain a land use plan.
2. The bulletin is organized as follows:
  - a. **Preface.** The preface explains the relationship of the land use plan to the BCP, presents the purpose of the bulletin, and offers the user an overview of the text.
  - b. **Chapter 1. The Land Use Planning Process.** For an introduction to land use planning and a quick summary of levels of the planning process. turn to Chapter I.
  - c. **Chapter 2. Goals, Objectives, and Policies.** This chapter presents the overall goals of base comprehensive planning as detailed in AFR 86-4. It then presents land use planning goals and objectives that should be used as a point of departure by base planners starting to draft their own land use plans.
  - d. **Chapter 3. Planning to Plan.** You will find assistance in this chapter with the following:
    - o Developing a land use planning program, including documentation of the process, resources required. information required. and how to involve the Air Force community in the planning process.
    - o Long-range strategies to be considered in developing a land use plan.
    - o An explanation of the three basic phases (Identification, Evaluation, and Implementation) that comprise the base comprehensive planning process.
    - o Initial preparation for planning, including background studies and data collection.

- e. Chapter 4. Functional Relationships Analysis.** This chapter details the following:
- o Factors to be considered in identifying and mapping functional relationships among land uses.
  - o Description of the nature of functional relationships among the 12 land use categories defined by the Air Force in AFR 86-4.
  - o Preparation of the functional relationships map and matrix.
  - o Analysis of constraints and opportunities and issues and needs.
- f. Chapter 5. Preparing the Future Land Use Plan.** Consult this chapter for methods of assembling data inputs, initiating the overlay mapping process, and preparing a sketch of future land use areas.
- g. Chapter 6. Relating to Neighbors and Regions.** The topics covered in this chapter include how the Air Force relates to, and must consider, the land use, socioeconomic, and cultural characteristics of the adjacent community and the surrounding region. Differences between zoning and planning are also discussed, and the larger view of the base within the region is presented.
- h. Chapter 7. Making the Plan Work.** Chapter 7 presents a number of ways to strengthen the planning process. These include the plan approval process, user group involvement, documentation, selling the concept, and feedback loops. Also consult Chapter 7 for information on updating the plan, accommodating change, and measuring the plan's success.
- i. Appendices.** To help readers visualize the results of the land use planning process presented here, a sample land use component narrative and a sample long-range development component narrative and plan are provided. Appendix D is a model statement of work for a contracted land use plan. The list of references includes all works referred to by the authors of the bulletin. Text citations are minimal to improve the document's readability. An annotated bibliography lists and describes works of special importance.

3. The recommendations and procedures contained in the bulletin must be interpreted and applied by base planners in light of the local and regional characteristics of their particular installations. Differences in the natural and built environments, cultural attitudes, climate, mission, character of surrounding region, etc., will all combine to produce a set of factors, unique to each installation, that influence land use planning.



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## Chapter 1: The Land Use Planning Process

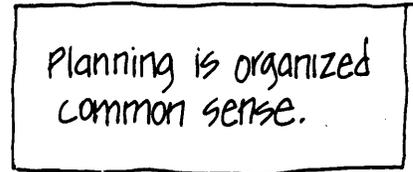
# CHAPTER 1: THE LAND USE PLANNING PROCESS

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## A. What is Land Use Planning?

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1-1. **The Planning Concept.** Planning has often been referred to as organized common sense. It is something we do every day as a natural part of our lives. In the planning process we must devise a specific course of action to follow over a period of time in order to achieve specific goals.



Planning is organized  
common sense.

### 1-2. **Planning Process and Product.**

a. The planning process consists of an organized decision-making system that ensures that specific actions (i.e., programs, policies, buildings, legislation, etc.) are directed toward achieving agreed-upon goals and objectives. The process can also be used to modify the plan when new information or changed conditions indicate that changes are required.

**PROCESS**

b. The product of planning is the plan, an expression in written and graphic form of a desired end-state to be achieved at some future date. The plan contains a set of coordinated goals and objectives and the general outline and characteristics of the desired end-state.

**PRODUCT**

### **1-3. Planning Organization.**

a. As an organized way of thinking about spatial, functional, social, and economic problems, planning is oriented predominantly toward the future, is deeply concerned with the relation of goals to individual and collective decisions, and strives for comprehensiveness in policies and programs.

b. The central question addressed by land use planning is: "How are activities to be distributed so as to meet stated objectives?"

c. To plan effectively, the planner needs to know his/her goals, the available resources, and the factors that may constrain or facilitate the achievement of the plan.

d. The process component of land use planning includes the analysis and logic process used to develop this future vision. The product side of land use planning includes the creation of a graphic representation of what the base should look like at a future date.

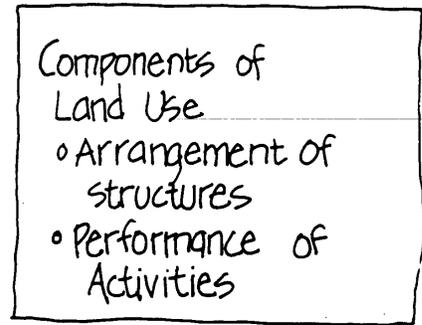
e. Land use planning must effectively integrate the physical elements of a base--the built and natural environments--and the human activities that take place within and around the physical elements of the base. This human element is the sociocultural environment. It includes working and daily living activities performed on the base.

## **MISSION SUPPORT**

## **ANALYSIS & LOGIC**

## **BUILT & NATURAL ENVIRONMENTS**

f. A point to remember is this: land use planning is not simply the grouping of all similar uses and facilities together in clusters; it is the arrangement of compatible activities in the most functionally effective and efficient manner. For example, military family housing areas, although shown as a single major land use category, may also include a shopette, child care center, recreational areas, and other complementary uses. Building placement and organization are important insofar as they enhance (or detract from) the effectiveness with which missions are accomplished and the quality of life at the base.

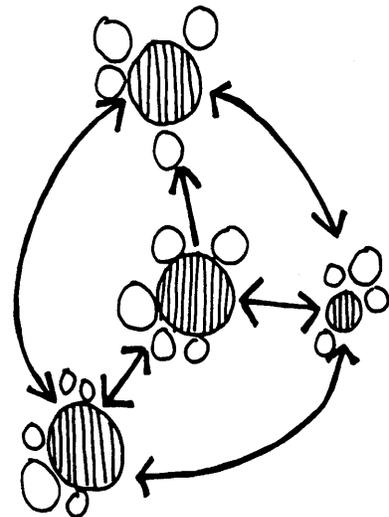


#### 1-4. The Installation Community.

a. Basic land use planning principles describe in general terms the structure of any Air Force base:

- o The structure of the base can be defined as a system of nodes (concentrations of compatible activities) and functional linkages.
- o Nodes are arranged by related activities (Figure 1-1). Larger, more diverse, and specialized activities are found in the largest nodes (e.g., the BX in the commercial community center), while smaller activities offering a less complete range of services are found away from the primary nodes (e.g., shopettes located within or near housing areas).

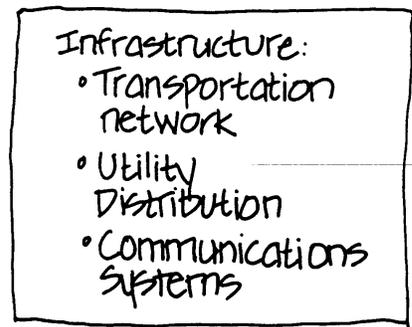
## PLANNING PRINCIPLES



**Figure 1-1. Activity Nodes and Linkages**

- o Surrounding each node is a "density" of interaction that declines with increased distance from the center.
  
- o The cost of overcoming distance exerts a pervasive influence on the distribution of activities and on the level of activity at any given location.

b. The existing base structure is a function of historic development, place, weapons systems technology, and military strategy. The array of land uses and the location of buildings, streets, and utilities evolved over time, as missions changed and needs evolved. The placement of activities also responded to the physical and natural environments that existed when each use was developed. The location of infrastructure, the proximity of functionally related activities, and the opportunities/constraints imposed by the natural environment all combined to determine the arrangement of structures and activities.



**1-5. Differences between Installations.**

a. Land use organization and functional relationships at any two Air Force installations will not be identical. They will vary according to differences in mission, technology, social development, cultural values, and the natural and built environments. That is why the land use plan at one installation is unlikely to apply elsewhere.

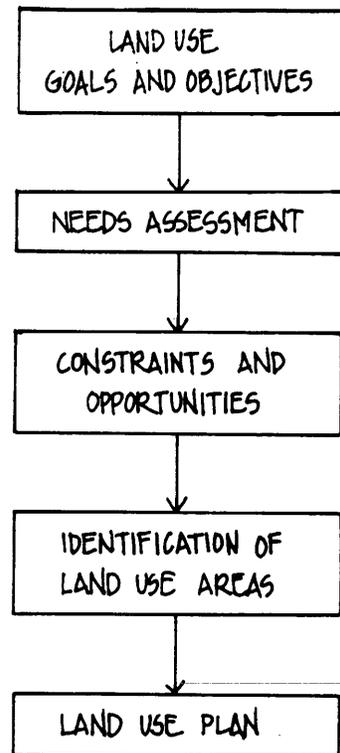
b. A central idea to be communicated in this bulletin is that land use planning is a way of thinking, a way of organizing an inquiry, and a way of setting the results of that process into an implementable plan. While solutions for particular problems will undoubtedly have prototypes elsewhere (e.g., the use of cluster development for housing), the mix of land use solutions at a particular installation will be unique.

**1-6. Planning Phases.**

a. Land use planning is a rational, sequential decision-making process. It is rational in its orderly approach (Figure 1-2). Land use goals and objectives for an Air Force installation are first identified and drafted. This is followed by an assessment of needs, with full consideration of the unique constraints and opportunities that exist at that particular base. The information collected is then used to develop a future land use plan clearly identifying areas by functional use. Finally, the plan is used to guide future development. The planning process must be a dynamic one, capable of accommodating change. When change dictates, a plan must be amended, not abandoned.

b. Land use planning is sequential in that it is performed through a series of well-defined steps that comprise the process. These steps proceed from an inherent logic, often from the general to the specific:

# LAND USE PLANNING AS A WAY OF THINKING



**Figure 1-2.**  
**Land Use Planning**  
**as a Rational Process**

- o Identification
- o Evaluation
- o Implementation

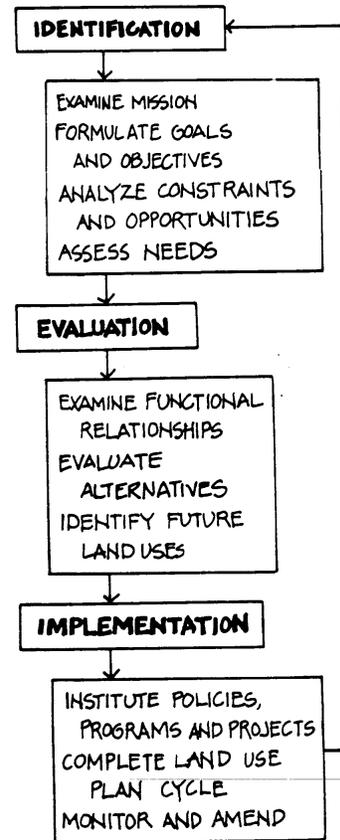
Figure 1-3 details the three phases of the land use planning component of the base comprehensive plan.

c. During the **Identification** phase the base planning team must:

- o Define land use goals and objectives consonant with its Air Force mission and analyze those of the surrounding region. Conceptualize needed programs.
- o Develop a comprehensive profile of the base, including natural resources, facilities, socioeconomic and demo-graphic characteristics, and existing land uses.
- o Determine constraints and opportunities.
- o Conduct a needs assessment to identify the base's problems and requirements.

d. In the **Evaluation** phase, information is analyzed and formed into the overall shape of the future land use plan:

- o Analyze functional relationships within the existing land use pattern.



**Figure 1-3. Planning Process**

## EVALUATION

- o Compare the functional relationships analysis with the constraints and objectives identified earlier to determine the most suitable configuration.
  
  - o Develop alternative future land use concept plans, and evaluate the relative strengths and weaknesses of each. Via the interactive planning process, develop the future land use map as the "chosen alternative."
  
  - o Prepare the recommended future land use plan.
- e. During the **Implementation** phase, detailed policies and programs are developed to implement the plan. Implementation activities include the following:

## **IMPLEMENTATION**

- o Development of specific policies, programs, and projects that respond to the land use goals and objectives, achieve the desired land use pattern, and maintain consistency with the other BCP components.
  
- o Incorporation of the land use plan into the BCP. Examine the long-range facilities development plan and the short-range capital improvement plan to ensure consistency.

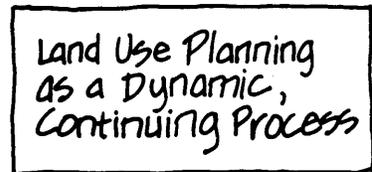
- o Ensuring that all facilities' sitings are consistent with the future Land Use Plan.
- o Amending goals and objectives, needs assessment, and policies, programs, and projects in light of changing conditions,

f. The land use planning process is an iterative one in that feedback is used to continually reassess decisions made earlier. For example, an installation's detailed evaluation of constraints and opportunities may require redefinition of the goals and objectives of the land use plan. Changes in goals and objectives should result in changes in policy. Similarly, as development occurs on base, the needs assessment may need modifications to take into account improvement in the land use pattern.

g. The planning process involves ideas from base users and residents as to how the base could best be laid out, what renovation is needed, and how functional relationships among and within land uses can be enhanced to foster a more worthwhile and vital environment within which to work and live.

h. Land use planning is a dynamic process that must not stop once a plan has been approved. It is worth reemphasizing that the land use plan is the primary vehicle by which the BCP is coordinated. It is used on a continuing

## FEEDBACK



Land Use Planning  
as a Dynamic,  
Continuing Process

basis to control facility siting, provide input into the facility development and capital improvement plans, and guide the evolution toward a more functional and pleasing land use pattern.

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## **B. Who is Involved?**

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### **1-7. Installation Commander and Base Facilities Board.**

Ultimate responsibility for base development rests with the installation commander, who relies on the base facilities board for recommendations regarding development decisions. The base environmental protection committee (EPC) is also a good source of planning input, coordination, and implementation.

**COMMANDER  
AND FACILITIES  
BOARD**

**EPC**

**1-8. The Base Civil Engineer (BCE).** The BCE is responsible for executing the planning process and developing the land use plan for approval by the installation commander and the facilities board. The planning staff, primarily the base community planner, is the focal point for plan development. The planners, however, do not and cannot develop the land use plan in isolation, but must obtain, coordinate, and consolidate information and inputs from a number of sources, both within and outside the BCE organization. Early participation and review by key BCE personnel from the programming (contract planning), engineering and technical design, real estate, and operations and maintenance sections are particularly important. Each has knowledge and experience in technical areas that must be considered if the final plan is to be reliable and realistic in its recommendations and timelines.

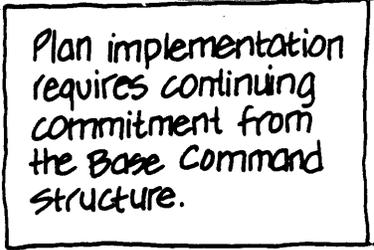
**BCE**

## 1-9. Residents and Employees.

a. A land use plan will affect all base residents and employees. Therefore, it is vital that the plan be developed by soliciting and considering the opinions and ideas of as many members of the base community as possible. The base community and the command structure need to adopt and support the plan for it to be successful. However, to be enthusiastic and supportive, base workers and residents need to feel that their ideas and comments were given a fair weighting when the plan was developed. People who labor in the work spaces, travel the roads, live in the housing, and use the community facilities confront problems daily. They have a valuable collective perception of needs and what land use arrangements have been successful. Involve these people. Solicit their comments. Hold open meetings. Keep people posted on goals and plan alternatives.

b. The concepts of good planning need to be fostered, to become part of people's way of looking at the base and the activities going on there. The broadest involvement in the planning process will obtain the broadest support and understanding for the plan during its implementation phase.

## RESIDENTS AND EMPLOYEES



Plan implementation requires continuing commitment from the Base Command Structure.

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## C. The Role of the Land Use Plan

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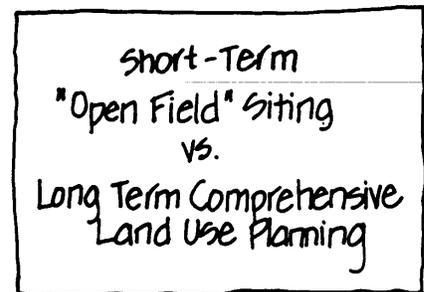
### 1-10. Guide for Decision Making.

a. The land use plan is a written and graphic guide to achieving long-term base goals. It is the basis for judging each siting proposal, demolition, or activity relocation proposed at the base. A land use plan charts a course of action to achieve specific, written goals. While it is true that this involves the thoughtful ordering of structures within the landscape, it extends well beyond this to include how space is used.

b. The role of a land use plan is to be the physical basis upon which to make the best use of base resources. The plan gives a context to decisions. It works to stave off short-term solutions to pressing needs which may appear reasonable at the time, but which create or fail to solve long-term problems. The plan gives a basis for going through an implementation phase that may have periods of inaction built into it, since all goals cannot be achieved instantly.

c. For example, a vacant area adjacent to two existing warehouses may seem a reasonable place to locate a badly needed third warehouse. Yet there are other factors that may be over-looked by focusing only on the warehouse and on current problems. In this example, the land use planning process may reveal that the original

## GUIDE FOR DECISION MAKING



Short-Term  
"Open Field" Siting  
vs.  
Long Term Comprehensive  
Land Use Planning

warehouses no longer efficiently serve their purpose, are poorly located for truck traffic, or are at a site that would be better used as expansion area for the nearby community center. And the plan may propose such reuse/ redevelopment in the longer term.

d. The land use plan, having gone through a rational decision-making process in which many factors had to be considered--analyzing functional relationships, considering how traffic will flow and what land needs are for other land uses--may have slated one warehouse for later demolition and one for adaptive reuse as a community center in three years. Replacement warehousing would be located where access is better and where consolidation of warehousing activities would result in substantial cost savings.

e. A "solve today's problem" view of the situation would have the third warehouse built near the other two. The land use plan view would have the new warehouse built elsewhere, near the site of the replacement scheduled to be built in three years. In the interim, supplies are split between two locations. In the end, the base operates more effectively, and all land use activities are improved.

f. Thus, the role of the plan is also to account for and explain when locations of activities appear to be illogical or inefficient in the short-term, but in reality are moving toward the "final" land use plan, which will maximize the long-term benefits to the base.

**Adaptive Reuse:**  
Process by which old buildings or complexes are converted to uses other than those for which they were originally designed.

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## **D. Land Use Planning as Part of Base Comprehensive Planning**

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1-11. Land Use Plan Component. The land use plan is a required major component of the BCP. There will be overlap between the land use plan and other BCP components because the land use plan draws on and synthesizes many important aspects of these supporting components. For instance, the transportation plan reflects and affects future land use patterns and the functional relationships among various base activities. Likewise, the facility development plan is essentially a means to implement the physical aspects of the land use plan's goals. The capital improvements program and the five-year defense program are shorter-range vehicles for executing the facility development plan.

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## **E. Benefits of Planning and Consequences of Not Planning**

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### **1-12. Benefits of Planning.**

a. Planning provides a long-range vision of the future within which to frame short-term decisions. The benefits of planning are worth the effort of creating and implementing the plan.

b. Among the benefits of planning are that it:

- o Gives commanders and base facility board members a sound basis for making development decisions.

## **LONG-RANGE VISION**

- o Involves the Air Force community in developing a workable and coordinated schedule for achieving goals and objectives.
- o Gives the BCE a basis for facility siting and programming.
- o Gives priority to problems, and out-lines solutions.
- o Creates an institutional memory.
- o Establishes a framework for responding to changes and opportunities in a coherent fashion.
- o Results in a better living and working environment.
- o Increases the likelihood of project approval because each project is part of a well thought-out plan.
- o Decreases future real costs through
  - Better energy efficiency,
  - More labor efficiency,
  - More rational and compact infrastructure requirements, and
  - Savings on operations and maintenance funds spent for upkeep of unnecessary structures, utilities, and roads.

## **INVOLVEMENT**

## **PRIORITIES**

## **FRAMEWORK FOR RESPONSE**

## **GETS APPROVALS**

## **COSTS DROP**

- o Frees funds for discretionary uses.

**1-13. Consequences of Not Planning.**

a. Failure to plan, or completion of only a half-hearted planning exercise, means the base will not realize these potential benefits.

b. Consider the negative - results of not planning:

- o No one in the chain of command has a coherent, comprehensive view of the base.
- o Decisions are made in a "crisis" mode and may be ad hoc or uninformed.
- o The effect of a given decision on the rest of the base and on future needs is very difficult to assess.
- o It is difficult to convince off-base reviewers that decisions are soundly based on a reasoned perspective.
- o Inefficiencies in energy use, use of infrastructure, and facility layout will continue, and even compound.
- o Operations and maintenance funds may be invested in keeping obsolete or inappropriately sited facilities operating.

**NO VISION**

**CRISIS  
DECISION MAKING**

**INEFFICIENCIES**

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## F. Types of Plans

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### 1-14. Levels of Planning.

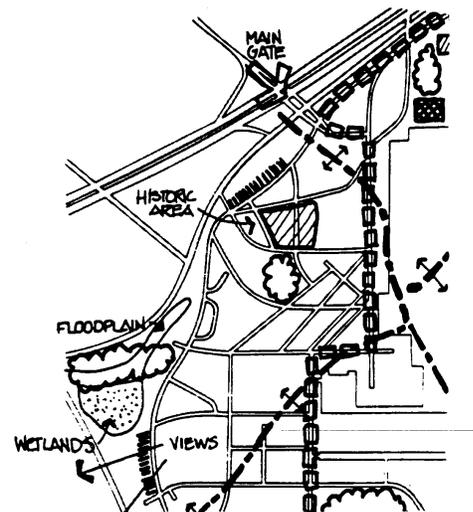
a. Planning can take place at many physical levels and in varying degrees of detail (Figure 1-4). Typical levels of planning are discussed below. Several of these are transitional-levels the base community planner will go through in developing the final plan.

(1) **Base Analysis.** While not truly a "plan," base analysis is a vital first step in preparing any plan. An inventory of physical, natural, and socioeconomic phenomena on and around the installation results in a composite map of planning factors (Figure 1-5). An analysis of this inventory will lead to an understanding of the physical and natural variations across the installation and the limit at ions they may impose on a plan and its consequent development. It will also yield an understanding of how various groups use the base.

(2) **Functional Analysis.** At each existing base, activities are already in place and operating. A functional analysis will serve to illustrate--through notes and sketches--the function-al relationships among the various activities (Figure 1-6). At the functional level the planner can ignore strict land use classifications and concentrate on the types of activities occurring at each base location. Once the relationships among activities are defined, it is



**Figure 1-4. Levels of Planning**



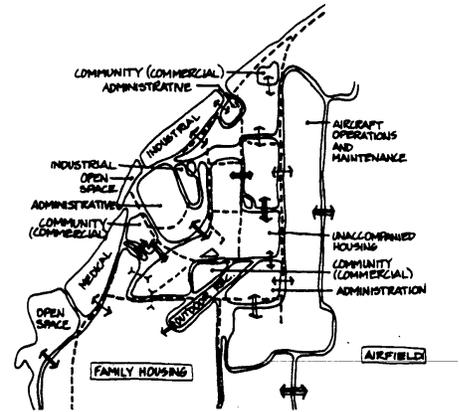
**Figure 1-5. Base Analysis**

possible to array them on paper, in the abstract. This modeling of activities promotes understanding of which linkages are close and frequent and which are weak or absent.

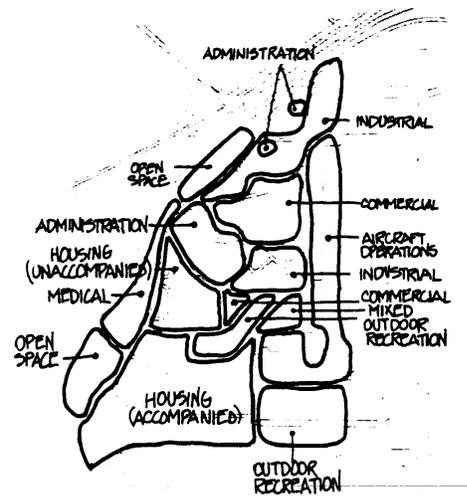
(3) **Draft Plan.** This level is a preliminary plan--part of the process during which planners "brainstorm" land use alternatives.

(a) The basis for the draft plan is a merger of the physical realities of the base and future needs, discovered in base analysis, with the functional analysis which shows how activities ought to relate.

(b) The draft plan is a working draft, made by sketching on overlay sheets (usually inexpensive tracing paper) (Figure 1-7). Successive layers of trace are used to bring forward good ideas and make amendments to the evolving draft plan. Working with markers on tracing paper, a group or individual can brain-storm solutions to problems, "move" buildings and roads into new configurations, and otherwise experiment. Each trace sheet can be numbered, dated, and set aside for future reference, or discarded, as the planning group works on other ideas. By posting earlier efforts on the walls, the group can quickly tap the entire range of ideas on how best to integrate function, need, geography, limitations, and other influential factors.



**Figure 1-6. Functional Analysis**

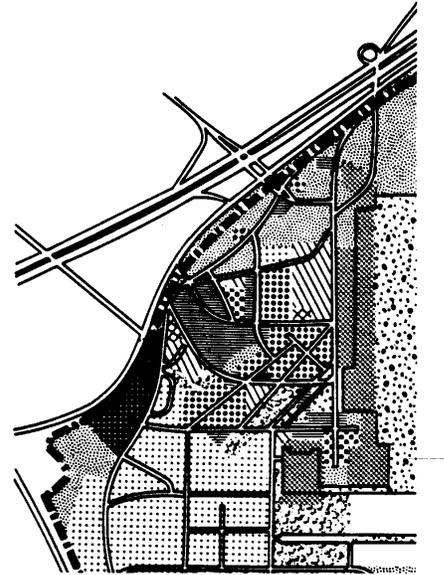


**Figure 1-7. Draft Plan Alternatives**

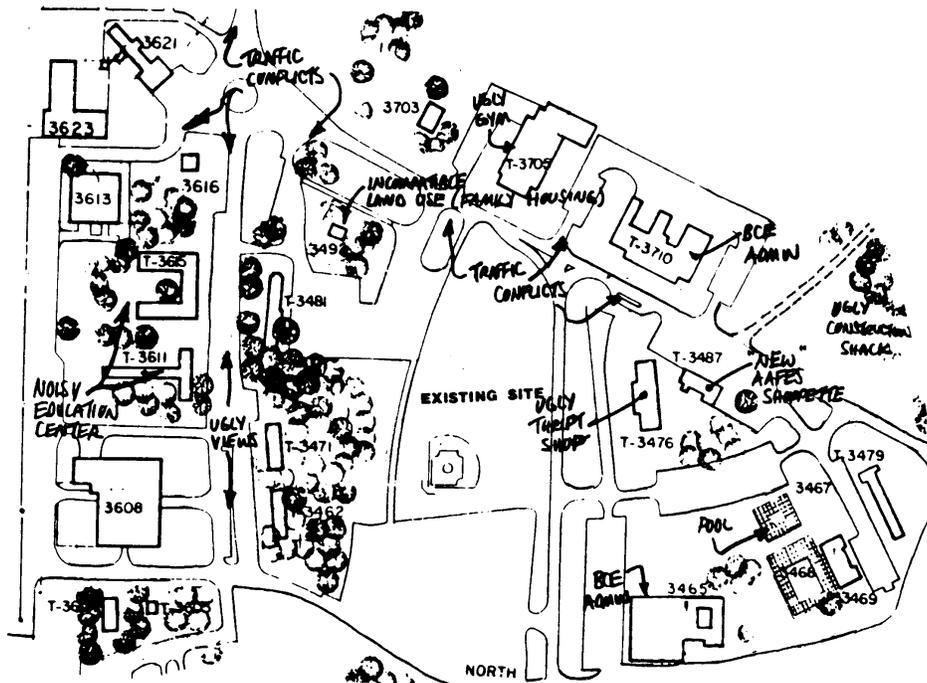
(c) This process results in several alternative arrangements of land uses that maximize resource use and important functional relationships, alleviate specific problems identified in data collection, and achieve the specific goals of the base.

**(4) Land Use Plan.** The land use plan (Figure 1-8) is a formal plan in that it is the product of a rational decision-making process, incorporates input from segments of the Air Force community, and has been officially adopted or approved by the base command structure and approved by the Major Command. Once the idea generation and experimentation of the earlier planning phases are satisfactorily performed, the land use plan is depicted graphically (Tab D of the BCP) and developed as a written report. The report explains the underlying information and the process used, the goals to be achieved, the reason for various aspects of the plan, and an implementation strategy.

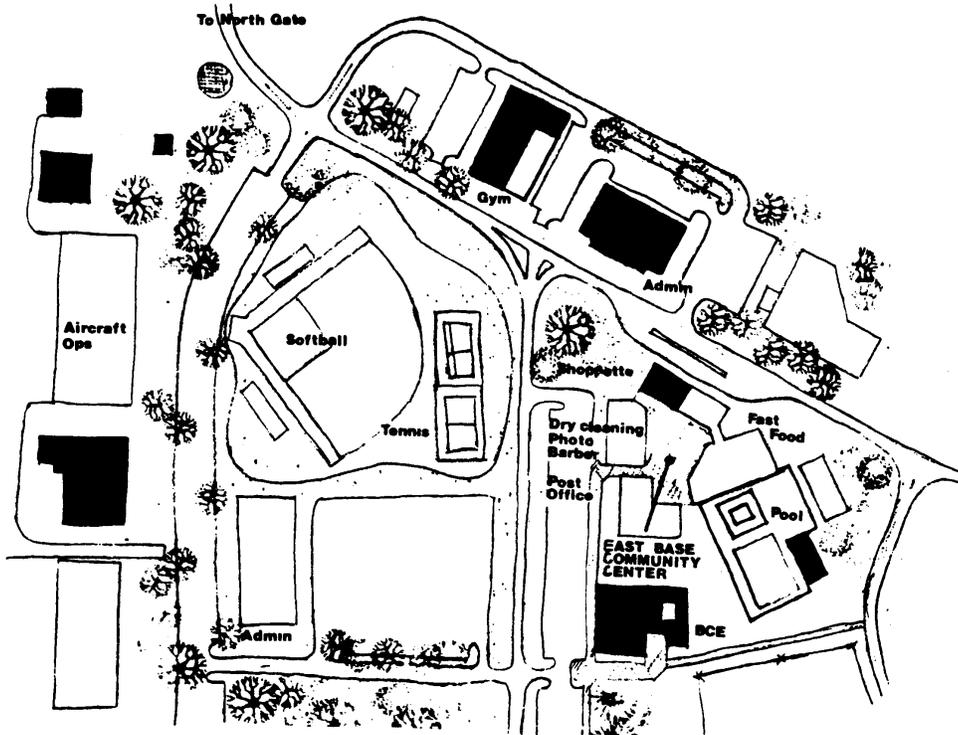
**(5) Area Development Plan or Master Plan.** This is a plan (Figure 1-9) which elaborates on the proposed development of a special area. It illustrates the functional as well as physical and human aspects of areas to be developed. This plan may be short range but could show proposed long-range (10-15 yrs.) physical changes. This would generally be a pre-design plan to establish roadways, pedestrian paths, parking, utility alignments, etc. Common applications are the community center plan, flight line master plan, AFRES area development plan, etc.



**Figure 1-8. Land Use Plan**



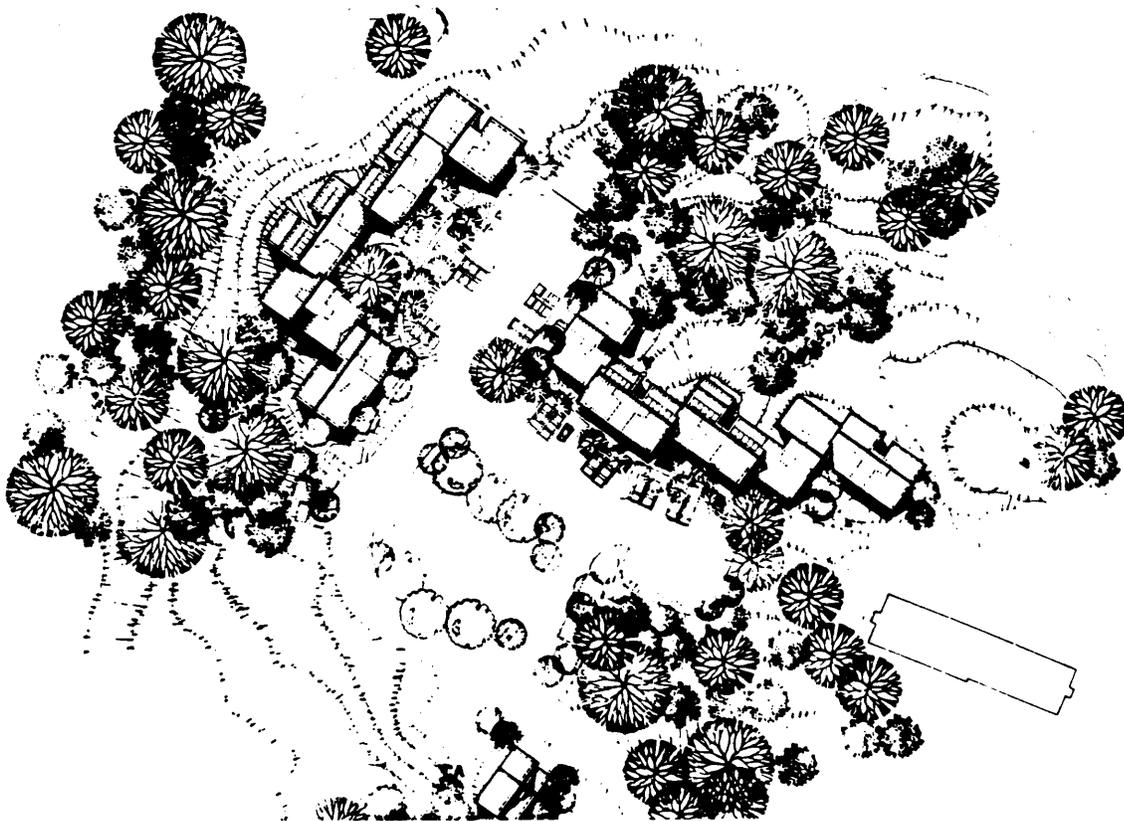
Existing Conditions



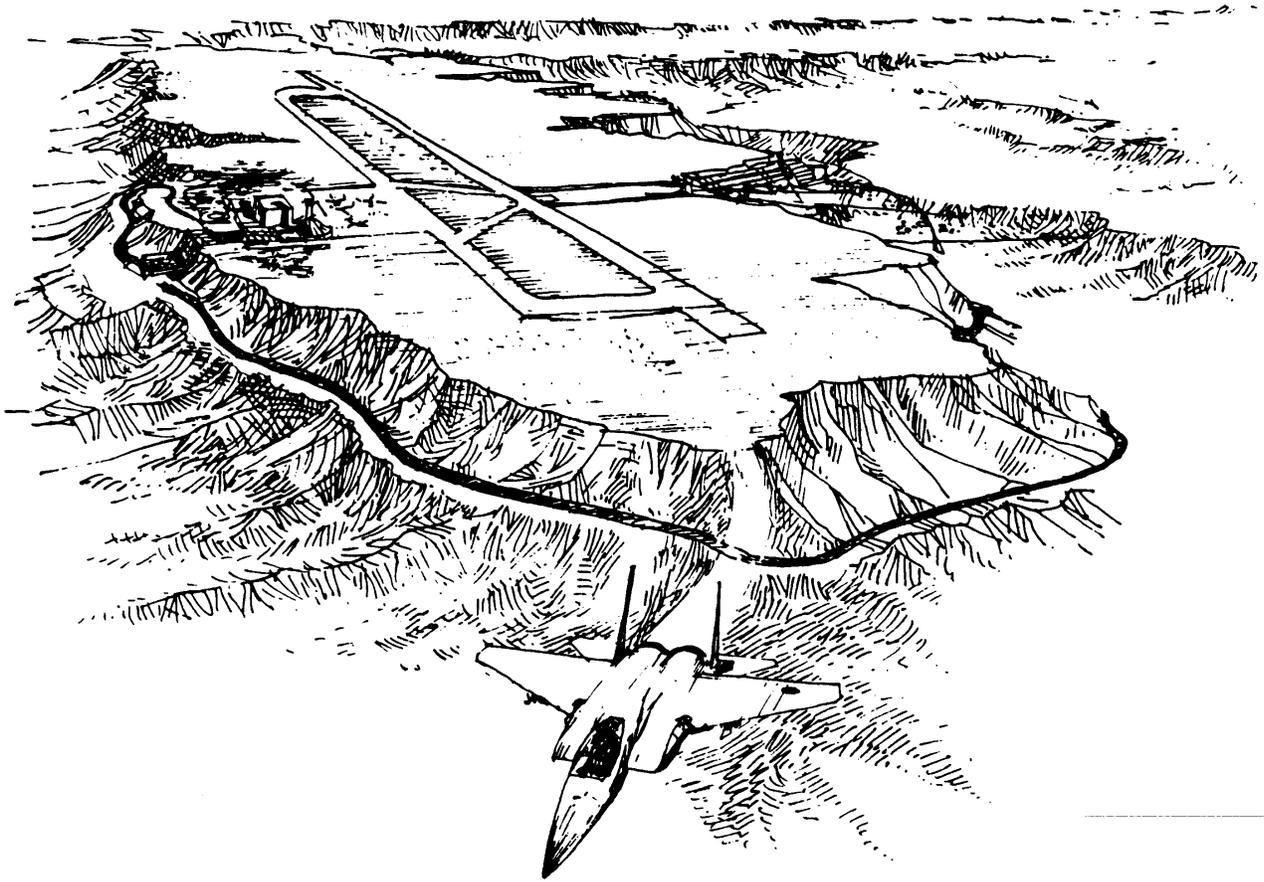
Future Conditions

Figure 1-9.  
Area Development Plan

(6) **Site Plan.** A site plan is a detailed plan for a specific project (Figure 1-10). It shows the relevant natural and built features of the site, including precise locations of buildings, parking areas, driveways, landscaping, fencing, walkways, signs, lights, etc. The site plan is a graphic representation of exactly what a site would look like when complete, if seen from directly overhead. Site plans are usually a pre-construction design phase.



**Figure 1-10. Typical  
Site Plan**



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## Chapter 2: Goals, Objectives, & Policies

# CHAPTER 2: GOALS, OBJECTIVES, AND POLICIES

## A. Hierarchy of Definitions

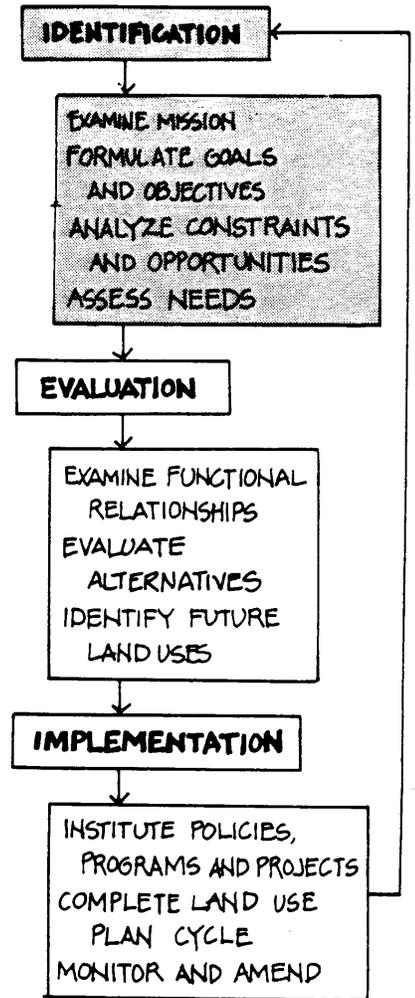
### 2-1. Starting Point.

a. Developing goals and objectives very early in the identification phase of the planning process is of paramount importance. This makes it imperative that the precise meanings of related terms be clearly understood. Frequently, terms like "goals and objectives," "policies," and "programs" are used interchangeably, with the result that the planning process is impaired from the start.

b. A set of definitions is presented below that should be employed throughout the land use planning process.

**GOAL:** A desired end-state, not necessarily quantifiable; a valuable target for planning.

**OBJECTIVE:** A more specific component of a goal; usually but not always quantifiable. Used to measure progress toward a goal.



**POLICY:** A definite statement about the direction that will be taken to achieve the objective, and thus, the goal. A guide for routine actions.

**PROGRAM:** A detailed plan of action for applying policy to advance toward an objective; usually describes the time and resources required for implementation.

**PROJECT:** A set of individually identifiable, specific tasks that comprise a program.

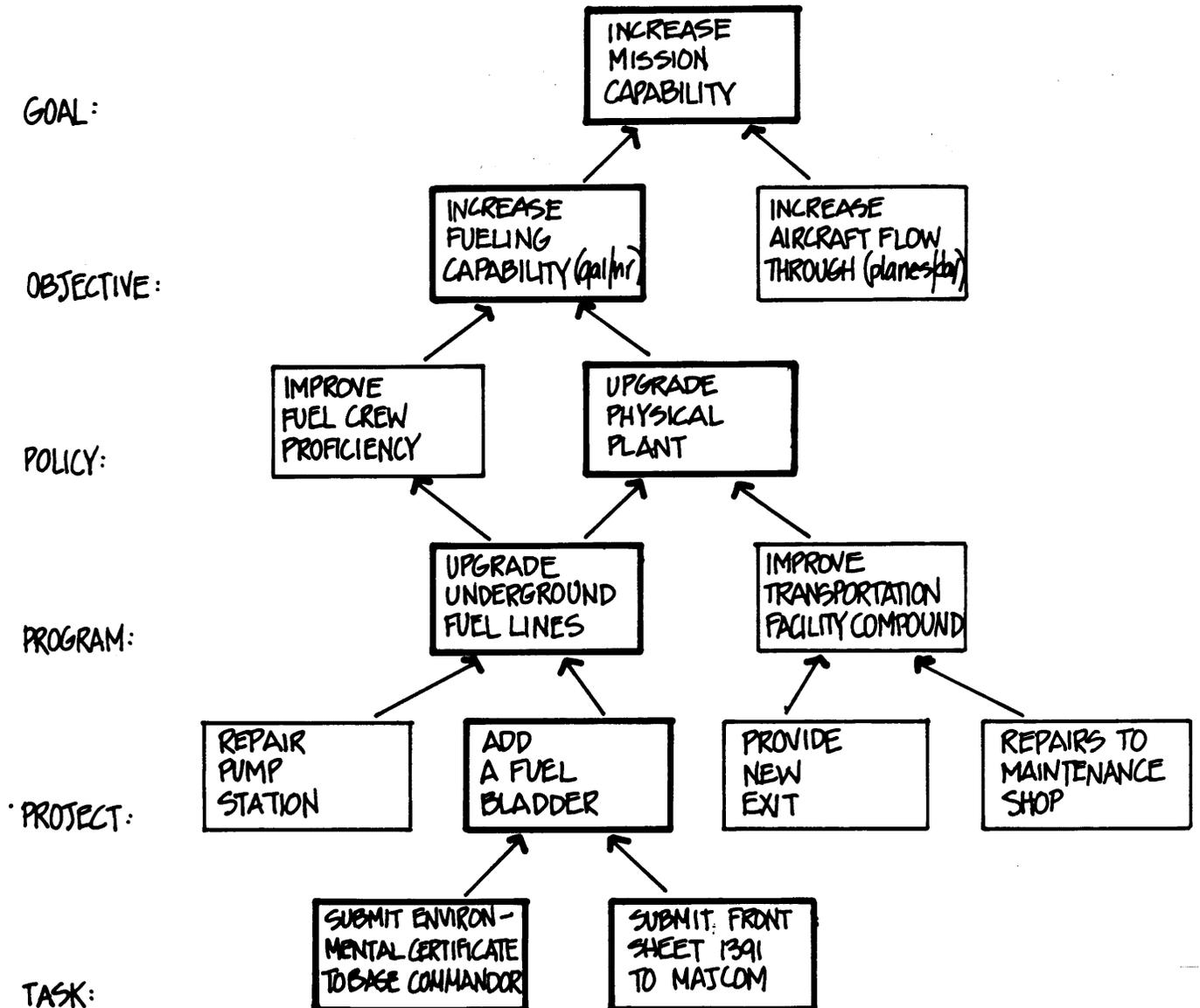
**TASK:** Smallest work element in the system; a single, focused work effort.

**MILESTONE:** An established point in time to help measure progress by completion of a task, project, or program.

c. This is a hierarchical set of definitions in that the goal is the broadest of the definitions; each succeeding term is narrower in focus. Also, it is hierarchical in that several objectives can be part of a single goal; several programs can help implement a policy, which in turn may be one of many leading to a single objective. Finally, an objective or policy at one level may be a goal or objective at a subordinate level. The hierarchy of terms, from goals to tasks, is illustrated in Figure 2-1.

Figure 2-1.

Hierarchy of Terms: Goals to Tasks



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## **B. Goals of Base Comprehensive Planning**

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### **2-2. Purpose.**

a. The primary purpose of the planning process is to support and enhance the operational mission of the installation. This is accomplished by providing a comprehensive plan that constitutes the framework for programming, design, and construction of on-base facilities, structures, and equipment. In the short run, the process links mission planning to developing policies, programs, and specific projects for on-base facilities and systems. In the long run, the overall development of the base, including the types and siting of facilities, is guided by the BCP.

b. The Air Force has developed goals for the BCP process. These are presented below.

- o Effective, orderly direction of the long-range development of the installation.
- o A comprehensive procedure for relating mission planning to policies, programs, and specific projects for on-base facilities and systems.
- o A framework for integrating coherently the different component plans of the BCP.

- o A complementary and harmonious relationship between the base and the civilian community, brought about and maintained through cooperative community planning.
- o Provision of the basis for developing a capital improvement plan, including guidelines for the siting of facilities.
- o Wise protection, use, and management of resources from the natural, built, and sociocultural environments.
- The highest possible quality of life for the Air Force community.

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## **C. Land Use Planning Goals and Objectives**

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### **2-3. Plan Development.**

a. The development of the individual base's land use plan will be guided by the articulation of goals and objectives during the first part of the identification phase. The importance of developing a well-conceived set of land use planning goals and objectives cannot be overemphasized. The unique mission of each base and characteristics of its built and natural environments require the base to customize its land use goals and objectives.

b. Presented below is a set of Air Force land use planning goals and objectives. These are based on the BCP goal of achieving optimal land use relationships both within the base and between the base and the surrounding community. These goals can be used as the framework for each base's effort in developing its own set.

**(1) Promote the most efficient and effective land use plan.**

- o Guide the location of facilities in a way that supports the current and projected mission of the installation.
- o Ensure that functionally related land use classes and facilities are located near each other.
- o Integrate the variety of environmental, historical, and technical data into a cohesive and practical land use plan.
- o Promote energy efficiency through facilities siting and layout of systems (e.g., utilities, transportation).
- o Encourage the grouping of compatible activities in a consolidated structure, where appropriate.
- o Protect and manage natural resources in accordance with national policies to benefit the public and enhance the base quality of life.

## **EFFICIENT AND EFFECTIVE LAND USE PLAN**

**(2) Plan for future growth and change.**

- o Provide for future expansion and construction of new facilities so that functional relationships are not adversely affected.
- o In life-cycle economics, allow for maximum adaptability and rapid implementation of changes in land use, facilities, and systems in response to changes in mission.
- o Ensure that future growth in adjacent off-base areas does not limit the ability of the base to perform its mission.

**FUTURE GROWTH  
AND CHANGE**

**(3) Promote compatible and coordinated land use decisions and policies by federal, state, county, and local agencies.**

- o Ensure that on-base and off-base land use in perimeter areas is compatible and complementary.
- o Use Air Installation Compatible Use Zone (AICUZ) guidance in base planning and promote its use in determining surrounding area development.

**COMPATIBLE,  
COORDINATED  
LAND USE  
DECISIONS**

**(4) Enhance the base's visual and aesthetic resources.**

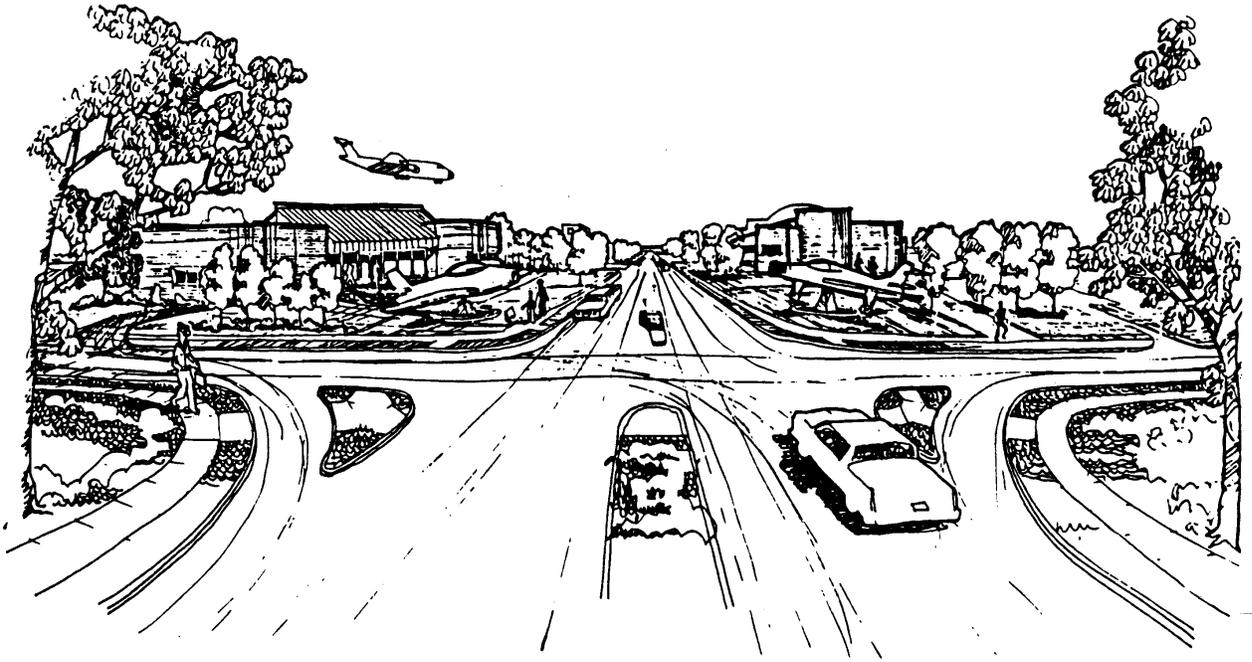
- o Make optimal use of desirable natural landscapes, such as scenic views, coastal locations, vegetation stands, rock outcroppings, etc.
- o Use visually compatible and complementary architectural designs and building materials.
- o Develop siting and landscaping guide-lines that ensure access to sunlight and preserve sightlines for individual structures.

## **VISUAL AND AESTHETIC ENHANCEMENT**

**(5) Maximize the well-being and quality of life of on-base personnel and residents of adjacent off-base areas.**

- o Provide natural areas for enjoyment and education.
- o Provide outdoor recreation for physical and mental well-being.
- o Preserve environmentally sensitive areas.
- o Provide for the separation of major transportation linkages from land uses heavily used by pedestrians.

## **QUALITY OF LIFE**



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## Chapter 3: Planning to Plan

# CHAPTER 3: PLANNING TO PLAN

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## A. Program Development

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### 3-1. Elements of the Program.

a. Land use planning results in a product (i.e., the land use plan), and consists of a process that implements the plan. Thus, it is imperative that base planners devote considerable effort early in the Identification phase to developing the structure and steps that will comprise a planning program that can accommodate both the product and process aspects of land use planning. The objectives of this program are to produce a coherent and implement able plan, and also to implement it effectively.

b. A land use planning program is made up of the following elements:

- o Documentation recording the plan and its implementation strategy.
- o People and resources committed to the program.
- o A system for collecting, validating, maintaining, and making use of information.



Aspects of a Land Use Planning Program:

- Producing a Plan
- Implementing a Plan

## PLANNING ELEMENTS

- o A means of involving the base community and promoting the plan and planning concepts throughout the installation.

c. The BCE planner in charge should have a subprogram for each aspect of the overall planning program. In developing a written program, the BCE needs to answer these and other questions:

**(1) Documentation**

- o Who is responsible for all aspects of the plan?
- o How will the process be recorded, and how will the written and graphic results be used?
- o How will compliance with AFR 86-4 be ensured and how will the plan be integrated into the BCP?

**(2) People and Resources**

- o Who is committed to the program: how long, what percentage of time?
- o What skills are needed? Available?
- o What resources need to be committed?

**(3) Information collection**

- o What is needed? What is available and what needs to be collected?
- o Who will be in charge of all data, where will it be compiled, and who will synthesize it?
- o What data needs to be regularly updated?

## **DOCUMENTATION**

## **PEOPLE AND RESOURCES**

## **INFORMATION**

# INVOLVEMENT

## (4) Involving the Community

- o How can the base command structure and the base community contribute ideas to the process?
- o How will they be kept informed?
- o What feedback mechanisms need to be established for both the planning stages and the long-term implementation?

d. To make the program work, these four elements have to be thought through and a plan devised for each. In the same way that a strategy is needed to implement a finished plan, a strategy needs to be developed to create the plan, foster its success, and create a means of keeping it current.

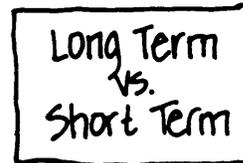
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## B. Long-Range Strategies

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### 3-2. Program Management.

a. The management of the planning program is a dynamic task. One aspect of this is the pace of daily needs versus the need for a longer-term strategy and a means of making daily decisions that work toward long-term goals. For example, there is the desire to make good use of perfectly serviceable buildings and the desire to build new facilities that are a better fit for the mission. Part of a long-range strategy could be to foster creative use and reuse of structures, but also to recognize when structures are truly

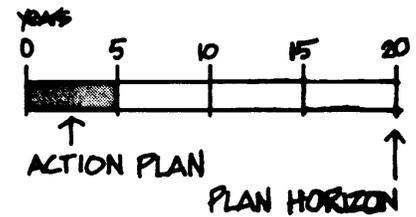


obsolete and a drain on resources in the long run.

b. The period of time for which the planner is prepared to plan will vary, depending on the particular aspect of a plan that is under scrutiny. Typically, a 20-year horizon is established for a plan, with a five-year action plan to get the plan's implementation on track (Figure 3-1). But in fact, some elements of a plan will have a different time frame. For instance, if there is a need for better directional signs throughout the base--with uniform design and consolidation--this aspect of a plan can be implemented in a very short time and be an obvious early achievement. Conversely, landscaping is a long-term program that must take into account the life span of vegetation, particularly trees. Some trees will become stately elements of the base's open space only after 40 to 60 years of growth. Fast-growing species will not grow to the same stature but will fill out an area more quickly. They will also die and need to be replaced sooner.

c. By having a long-range strategy for each element of the plan, the planner avoids being drawn into the need for a "quick fix" or an immediate payoff. A better sign system is the contribution to the base next year; a mature, aesthetic landscape is a legacy to be fully enjoyed by future generations of Air Force personnel at the base.

## ULTIMATE BASE DEVELOPMENT



**Figure 3-1.**  
**Plan Periods**

d. Critical time constraints are often imposed on the plans' implementation period by the project approval and funding process, as well as the design and construction process. A realistic plan schedule can only be developed if the planners are familiar with the delays and uncertainties inherent in these processes. The BCE programming (contract planning), engineering, and technical design sections are the normal information- sources in these areas.

### **3-3. Program Schedule.**

a. By tying the land use plan to the transportation plan and the facilities development plan, the planner can devise a master schedule for all goals. Then, working with the available funding programs (MCP, O&M, NAF, etc.), he or she can plot a strategy to achieve each intermediate goal. By having a documented strategy, base personnel responsible for planning and plan execution can take advantage of sudden funding opportunities as well as know in advance how programmed funds will be spent in the years ahead.

b. Reviewing the strategy periodically is a good practice, as changes in mission, the arrival of new tenants, or new directions from headquarters may create a need to revise the strategy and schedule.

c. A further benefit of the carefully documented long-term strategy is that it lets

subsequent decision makers know about base commitments. When a change is needed, the strategy quickly shows commitments which can be delayed or revised.

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## **C. Analysis of Planning Factors**

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### **3-4. Characteristics.**

a. Each installation will have characteristics that either constrain development or present unique opportunities. Planners must identify and understand the extent of these constraints and opportunities before beginning to develop the land use plan. For example, environmental factors such as steep slopes, flood plains, hazardous waste sites, etc., may limit development potential. Conversely, a base located along the seacoast would present an excellent opportunity for developing housing that offers access to the water-based activities and a scenic view.

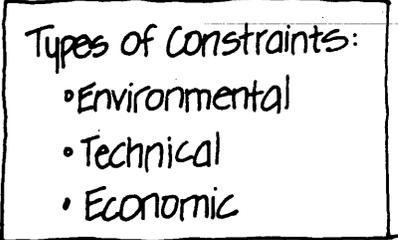
b. The analysis of constraints and opportunities has two primary purposes in the land use planning process. First, land use plans should be designed with a full awareness of the applicable constraints and opportunities. It is a waste of effort to propose development of an area that is clearly infeasible due to constraints that cannot be avoided or mitigated.

c. Second, the constraints and opportunities are used in evaluating the land use plan. It is evaluated on the basis of how well it conforms to the constraints, and to what extent it takes advantage of the opportunities.

### 3-5. Classes of Planning Factors.

a. There are generally three classes of planning factors: environmental, technical, and economic. These factors can take the form of either constraints or opportunities, depending on the specific situation.

b. The first two classes are similar in that they are mappable (Figure 3-2). They can be used to indicate graphically the suitability of certain areas of a base for development. Environmental and technical factors can limit the suitability of a particular facility or structure at a specific location. The third class is generally not mappable and does not operate in a spatial context.



Types of Constraints:

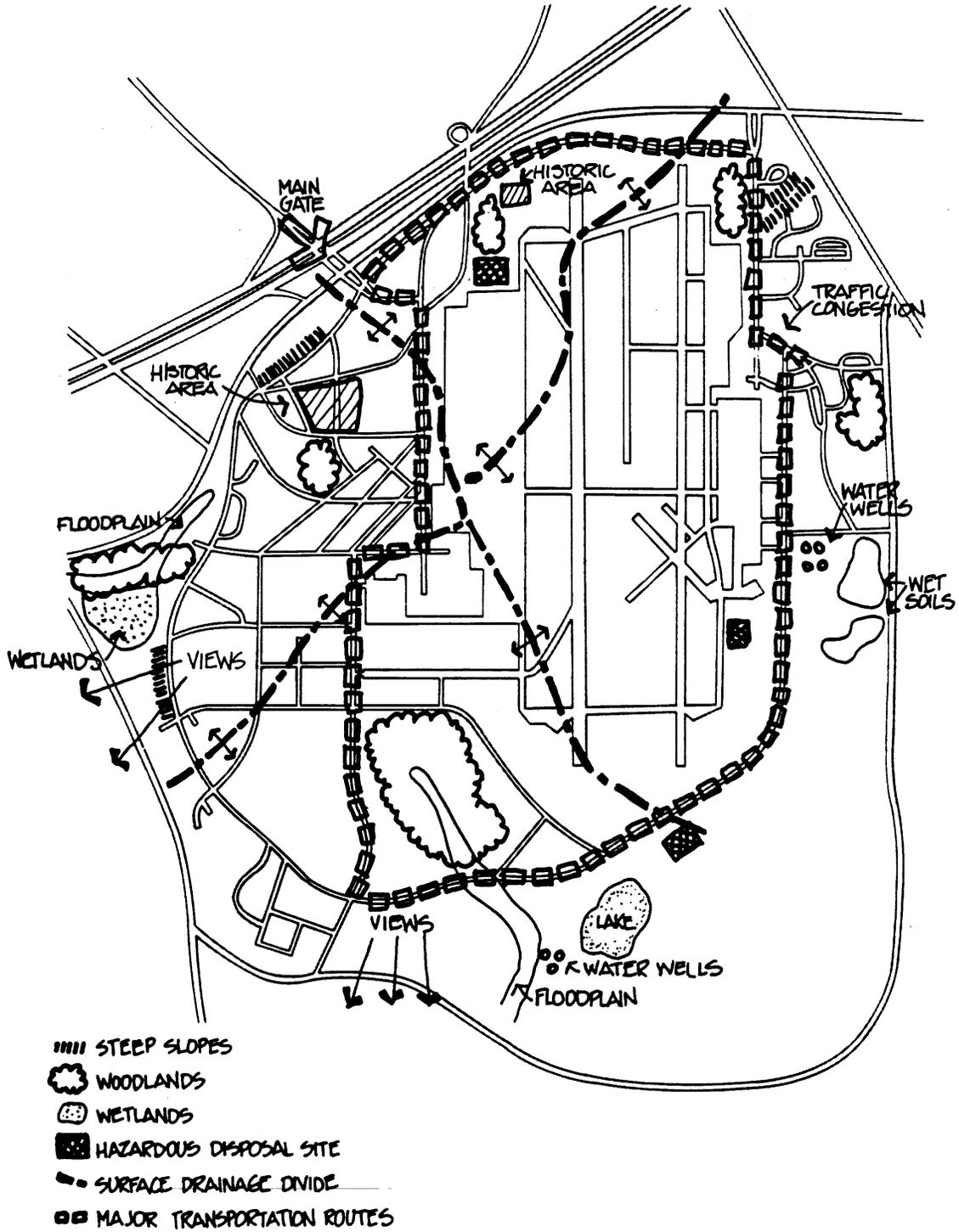
- Environmental
- Technical
- Economic

### 3-6. Map Environmental Factors.

a. The first step in dealing with planning factors is to examine and map the environmental factors. These are defined as features of the natural environment that affect the development of areas because either (1) they should be preserved, or (2) they must be taken into consideration in determining the potential environmental impacts of development. It should be noted that

Figure 3-2.

Planning Factors Map

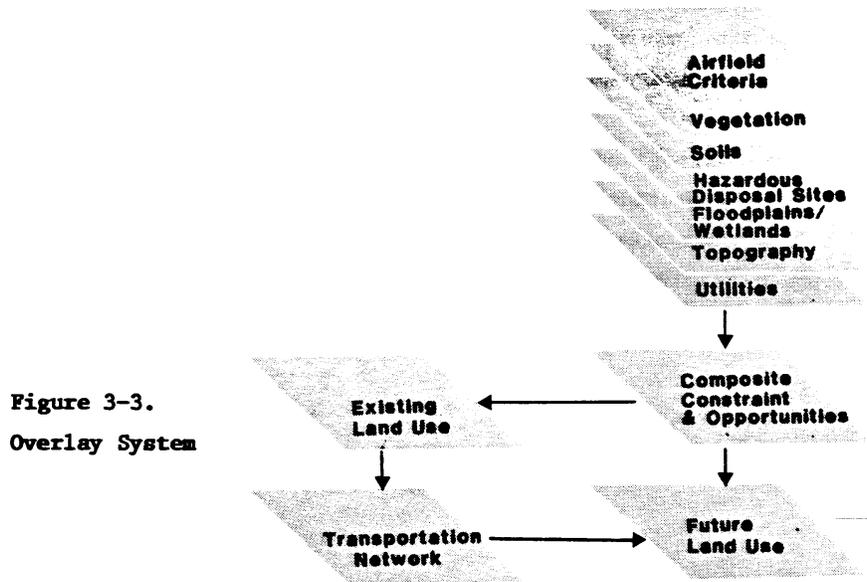


some features of the natural environment, such as soils, directly affect the economic and engineering feasibility of developing a site. These are referred to as "technical constraints" and will be discussed later.

b. One technique to display planning factors is the overlay/composite method. The environmental factors are displayed on map overlays showing areas limited to or precluded from further consideration for certain types of development. These maps must be produced at the same scale as the installation's base map (C-1 Tab). Dimensionally stable film should be used for each overlay layer.

c. Each overlay is then placed on the installation's base map. The composite limitation of development is the sum of all the areas indicated by each overlay (Figure 3-3).

d. There are a wide variety of potential environmental factors. They vary in terms of the limitations they place on different types of land uses. For example, an area lying within a flood-plain is clearly limited in terms of its suitability as a location for industrial, housing,



administrative, community, commercial uses etc. However, floodplains are suitable for use as open space or as locations for outdoor recreation facilities.

e. In preparing the overlays, planners should attempt to place information by major environmental category (i.e., topography, soils, hydrology, etc.) on one map where possible.

### **3-7. Map Technical Factors.**

a. The second step of the analysis is to map the technical factors. These are defined as characteristics of the built and natural environments that affect the technical feasibility and cost of developing a particular location on an installation. These factors relate primarily to the ability to apply engineering solutions to the feasibility of developing a site. In some cases, engineering solutions may not be technically feasible, while in others- they may be so expensive as to effectively preclude development.

b. The BCE engineering and technical design section, and operations and maintenance branch. and the base communications (information systems) organization are the usual sources of information for technical constraints involving utility and

transportation systems facility requirements and site conditions. Although certain data may be available on some Tabs (such as the G Tabs for utility lines), careful review and coordination among these agencies is necessary to verify the accuracy of the information and to identify the potential problems and opportunities resulting from existing conditions.

c. Other technical constraints involve the availability of land and facilities. The BCE real estate section normally maintains information on easements and leases, as well as basic information on existing buildings (occupancy, age, type construction, size).

### **3-8. Identify Economic Factors.**

a. Finally, planners must analyze the economic constraints and uncertainties. Some of the economic constraints are directly measurable. Others, such as the base's contribution to the surrounding region's economy, require a more qualitative analysis.

b. Planners must also be aware that project cost, time needed for approval, and implementation (construction) are interrelated due to the uncertain nature of the funding and approval process and the design and construction process. A basic understanding of these processes is necessary if the planners are to adequately analyze the effects and implications of economic constraints. The BCE programming (contract planning) and engineering and technical design sections are normal sources for this information.

c. Charts A-1, A-2, and A-3 list planning factors to be considered and possible information sources. Planners should review the charts to determine the factors applicable to their particular situation, and to see if additional factors need to be mapped for their base.

## Chart A-1: Environmental Planning Factors

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### Factors

#### Hydrology

- Existence of an aquifer recharge area.
- Proximity to drinking water supply wells.
- Surface water quality (i.e., protect high-quality surface water bodies).
- Depth to groundwater.
- Floodplains: the more important or valuable the facility, the longer the return frequency of flood that should be used.
- Drainage channels and direction of flow.

#### Noise

- Areas with high ambient noise levels (unsuitable for certain types of development, such as residential).

#### Topography

- Steep slopes (15% or greater).

#### Air Quality

- Maintenance of existing ambient air quality- . Emissions limits imposed on new sources.

#### Ecology

- Known locations of rare or endangered species.
- Wildlife habitat.
- Concentrations of valuable or unique vegetation.

### Information Sources

Installation Restoration  
Program (IRP) Phase I  
Report

AICUZ Report

Local Planning Agency

U.S. Fish and  
Wildlife Service

## Factors

- Forested areas.
- Wetlands.

### Geology

- Faults.
- Seismicity.
- Depth to bedrock.

### Aesthetic Resources

- Scenic natural features, such as rock outcroppings, creeks or ponds, trees, buffer areas, etc.
- Scenic views that result from hills and sloping terrain.

### Archaeological or Historic Structures

- Buildings or structures listed on the National Register.
- Historical, cultural, archaeological, or religious sites or structures.

### Soils

- Productive soils (especially prime or unique farmlands).
- Load-bearing capacity.
- Foundation suitability.
- Permeability (i.e., septic system suitability).
- Hazardous waste sites.

### Disturbed Lands

- Borrow pits.
- Old foundations.
- Landfills.
- Hazardous waste sites.

## Information Sources

IRP Report

State Historic  
Preservation Office

U.S. Soil  
Conservation Service

IRP Report

## Chart A-2: Technical Planning Factors

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### Factors

#### Utilities

- Availability of, or proximity to, water, sewer, gas, electric, and communication lines.
- Capacity of utility systems (includes capacity of distribution and trunk lines and available supply--i.e., including treatment capacity).

#### Land Supply

- Presence of undeveloped land.
- Existing easements, leases.

#### Transportation

- Capacity of primary and secondary routes leading to site.
- Flow conditions on nearby roads.
- Road segment's operating over capacity during peak commuting periods.

#### Safety

- Presence of development in clear zones or accident potential zones.
- Presence of hazardous materials, including radioactive materials.
- Airfield and air space clearances and set-backs.
- Explosives quantity-distance safety clear zones.

### Information Sources

G-Tabs

Civil Engineering  
Operations and  
Maintenance

C-1 Tab

Civil Engineering  
Real Property

Military Traffic  
Management Command  
Report

AICUZ Report

IRP Report

AFR 86-14

AFR 127-100

**Factors**

- Radio frequency (RF) hazards.
- Fire, security police, and medical service capacity to accommodate new development.

## Physical Security

- Antiterrorist measures.
- Lines of sight.
- Secure areas.

**Information Sources**

Bioenvir. Engineer  
Each Agency

Security Police

## Chart A-3: Economic Planning Factors

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### Factors

#### Project Costs

- What is the life cycle cost (i.e., levelized annual unit cost)?
- Are extraordinary and costly engineering measures required to overcome site deficiencies?

#### Local and Regional Economic Impacts

- Will there be a decrease in employment of the area's residents?
- Will the regional economy be affected?

#### Budget

- Are time constraints imposed for the expenditure- of funds (i.e., must they be spent within a given period)?
- Are there any time delays in budget approval process?

#### Investment in Infrastructure

- Will significant additional funds be required to supply infrastructure (e.g., utilities, streets, etc.)?

### Information Sources

Civil Engineering  
Contract Programming

Local Planning Agency

Civil Engineering  
Contract Programming

Civil Engineering  
Operations and  
Maintenance

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### **3-9. Realistic Planning.**

a. A plan which fails to adequately consider the implications of technical and/or budgetary constraints, uncertainties, and critical short-term effects will either be ignored or will be a source of continual controversy.

b. Consider carefully recommendations which involve the following or similar actions:

- o Relocation of several related facilities at different times. Can the affected agency operate effectively during the interim periods when the facilities are separated, particularly if necessary funding is delayed?
  
- o Area selections which appear attractive functionally, but which will require extensive site or infrastructure development. If an individual project (for locating a facility in the area) must absorb the cost of the improvements, it may face additional delays and increased uncertainty during the approval and funding process. Also consider the effects on future projects if a utility or transportation development project is delayed or canceled.

c. A good plan is a balance of long-range vision and careful reconsideration of short-term effects and realities. Base organizations and

tenant units must be able to perform their mission effectively during "interim" periods on the way to achieving future land use goals.

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## **D. Needs Assessment**

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### **3-10. The Base Physical Plant.**

a. One of the major determinants of the shape of the future land use plan is' the ability of the base's current physical plant (e.g., buildings, equipment, infrastructure, and systems) to adequately house and support its various activities and functions. At any point in time, a base is always in the process of upgrading its physical plant by a variety of means. These include:

- o Rehabilitating and renovating old buildings and utility systems.
- o Demolishing substandard and dilapidated structures.
- o Constructing new buildings.
- o Expanding undersized facilities.
- o Consolidating related functions and activities that are presently scattered in a large, centrally located structure.

## **CAPACITY OF PHYSICAL PLANT**

b. A crucial phase in the land use planning process is to determine the need for future capital improvements, particularly of buildings and infrastructure, that will have a significant influence on the base's land use pattern. These requirements must be developed from an accurate assessment of the current problems and deficiencies in the installation's physical plant.

c. A needs assessment should follow the planning factors analysis. Knowledge of these factors will enable planners to more easily develop specific assessments of the need for remedial action. For example, a constraint on the future development of family housing due to a shortage of sewage treatment capacity can be easily translated into an assessment of how much additional capacity may be required, and where the new trunk lines should be located.

d. A needs assessment should be performed by examining each of the functional land use areas in detail with regard to the following issues:

- o Are there buildings or structures whose condition is so deteriorated that they should be demolished?
  
- o Are there buildings that are clearly inadequate and substandard for the activities and functions they contain, due to deficiencies in size, design, layout, etc.?

- o Are there examples of dispersed but functionally related activities whose collective efficiency could be improved through consolidation in a single structure?
  
- o Are there buildings clearly in bad locations (i.e., incompatible with their surroundings, too inaccessible to pedestrians, ill-served by the on-base transportation system, etc.)?
  
- o Are there buildings that are clearly underutilized and present opportunities for improved efficiency of use through renovation, rehabilitation, etc.?

e. Throughout the analysis of planning factors and the preparation of the needs assessment, specific strategies or means will become apparent for overcoming constraints, meeting identified needs, etc. Planners should record these for later development as detailed policies, programs, or projects for implementing the land use plan. The identification of these specific means at the end of the identification phase clearly shows that a planning process is not paced through in the strict sequential fashion that is implied by a flow chart. In fact, planners are likely to be moving back and forth at one time between several parts of the process. Chapter 7 discusses the development of base policies, programs, and projects.

## **RECORD STRATEGIES**



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## Chapter 4: Functional Relationship Analysis

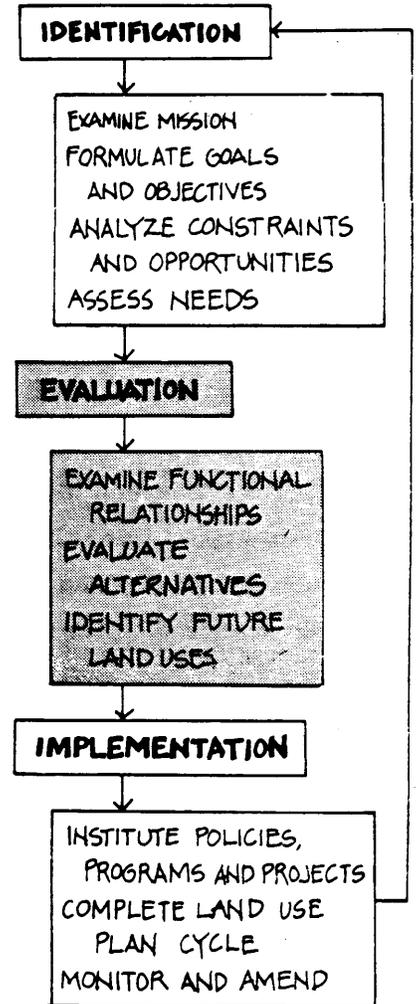
# CHAPTER 4: FUNCTIONAL RELATIONSHIPS ANALYSIS

## A. Defining Functional Relationships

### 4-1. Dependent Land Uses.

a. The **Evaluation** phase of the planning process begins with an examination of the functional relationships among land uses. A functional relationship exists between land uses when there are dependencies between the activities that comprise each use. Dependencies are evident by the flows (e.g., raw materials, information, people, energy, support services, administrative services, finished goods, etc.) between these land uses. A functional dependency exists when the efficient performance of activities within one land use class depends upon maintaining or enhancing the flows that originate in another use.

- b. Criteria which affect functional relationships include:
- o Ability to efficiently and effectively accomplish the installation mission.
  - o Flexibility to respond and adapt to changing conditions.
  - o Security of sensitive functions and the ability to control access and respond to emergency situations.
  - o Maintenance of necessary communication linkages.



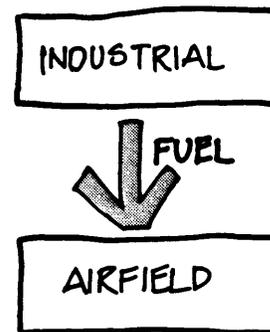
c. The ease of maintaining flows between dependent land uses, and thus of increasing the efficiency of the activities that comprise each use, is most easily attained by locating them next to each other. There are a number of benefits to be gained through the spatial proximity of dependent uses:

- o Increased efficiency and productivity in performing activities.
- o Shorter transit times.
- o Decreased shipping costs.
- o Opportunity for more face-to-face interaction.
- o Enhancement of interpersonal relationships.

d. Flows between dependent land uses may be in one or two directions. A one-directional flow, such as fuel from an industrial area storage tank to the airfield, implies a one-way dependency in which only one of the land uses, the airfield, is the primary beneficiary of the proximity of the two uses (Figure 4-1). The efficiency of airfield activities directly depends upon proximity to fuel. In a sense, the location of the airfield determines where the industrial activities will be located.

e. A flow in both directions implies that efficiency of activities in both land uses benefits by the maintenance or enhancement of the flows between them (Figure 4-2). As an example, unaccompanied personnel benefit by living close to the community center, as they are dependent

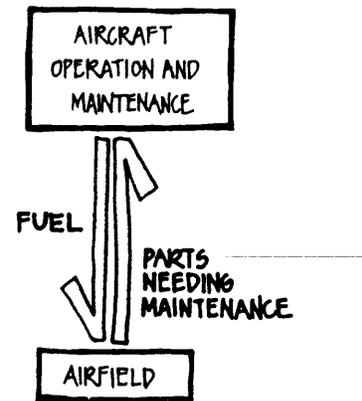
## MAINTAIN FLOW



**Figure 4-1. One-Way Dependency**

upon the facilities found there (e.g., BX, restaurant, laundry, etc.), and because they are less likely than other personnel to have access to automobiles. Similarly, the community center becomes a more fully used and meaningful focus of social interaction when it is easily accessible to unaccompanied personnel.

f. Land uses may also be linked through organizational relationships and compatibility or incompatibility of their component activities. Links may occur when there is no dependent relationship between adjacent land uses, but the external effects of one use (e.g., noise, smoke, vibrations, etc.) adversely affect the other. A reverse situation can also occur in which the quality of the environment of one use is enhanced by being located near another. A common example of the latter is taking full advantage of scenic views and open space in locating and preparing site plans for military housing.



**Figure 4-2. Two-Way Dependency**

**4-2. Dispersal.** In certain cases, facilities within land use categories may be incompatible. For example, the weapons storage area (WSA) and the petroleum, oil and lubricant (POL) storage area are both in the industrial land use category. These facilities must be separated due to the safety hazards associated with both, and because the destruction of one facility could destroy the other (collateral damage). This is also true of essential facilities within the aircraft operations and maintenance category, which may require dispersal to enhance their survivability in a combat environment.

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## **B. Identifying Functional Relationships**

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### **4-3. Purpose.**

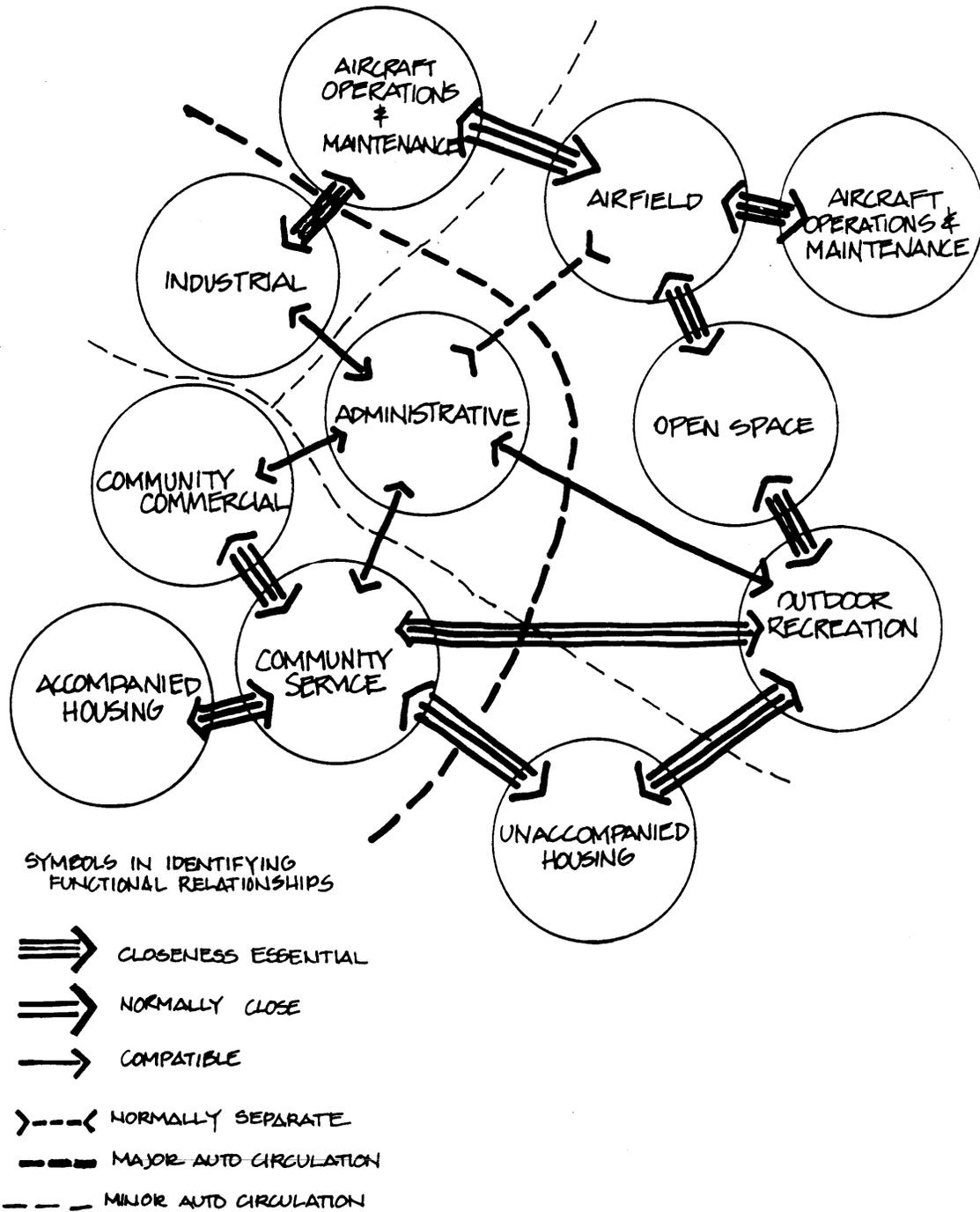
a. The purpose of preparing a functional relationships analysis is to determine the spatial relationship between functionally related land uses. Figure 4-3 provides an example. This type of analysis indicates the dynamic nature of land use, which is the relationship between activities distributed spatially over an area (e.g., an Air Force installation, a region, town, state, etc.). Functional relationships analysis recognizes that land use is more than simply the location of facilities.

b. The identification of functional relationships requires coordination among members of a broad range of base activities and organizations. This involvement is necessary to fully understand the nature of flows between areas from the perspective of the users. Participation by the Air Force community in this analysis will also enable planners to better understand the activities performed at different points around the base and the relationships among them.

**4-4. Tab D-7.** Preparation of the functional relationship map (Tab D-7) will enable planners to better understand and graphically represent the dynamic components of the base land use pattern. This understanding is essential for decision makers to have before they begin to think about siting new facilities or

Figure 4-3.

Example of a Functional Relationships Analysis



consolidating activities within one building. The analysis should consider both the relationships between on-base land uses, and those between the base and the adjacent, off-base areas.

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## **C. Classifying Land Uses**

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### **4-5. Twelve Land Use Categories.**

a. The following 12 categories comprise the basic land use types found on an Air Force installation:

- o Airfield
- o Aircraft Operations and Maintenance
- o Industrial
- o Administrative
- o Community (Commercial)
- o Community (Service)
- o Medical
- o Housing (Accompanied)
- o Housing (Unaccompanied)
- o Outdoor Recreation
- o Open Space
- o Water

b. The above categories are primarily functional in nature; they are composed of activities that have a common general purpose. For example, all of the facilities, equipment, and structures found under the Aircraft Operations and Maintenance classification are used to perform or

support the flying mission. Each land use can be evaluated according to the following criteria:

- o What other types of land uses (and their significant activities) are essential to the efficient functioning of activities or facilities associated with this land use?
- o What are the nature of the interactions between the different land uses?
- o Are operational efficiencies gained as the land uses are located closer to each other?
- o What are the type(s) of flow(s) between land uses (e.g., people, information, materials and supplies, etc.)?
- o What are the characteristics of the flows (e.g., size, frequency, timing)?
- o Are there any external effects associated with a land use that would adversely affect another adjacent use?
- o Is the land use "footloose" or does it have specific locational requirements in terms of site suitability (e.g., soil characteristics, minimum area, need for utilities, security precautions, etc.)?

c. Charts B-1 through B-12 describe functional relationships among the 12 major Air Force land uses. Chart B-13 summarizes these relationships. The degree of closeness between and among land uses depends upon operational necessity, convenience, or compatibility. The following definitions are used as a guide:

-  NO FUNCTIONAL LINKAGE
-  INCOMPATIBLE: FACILITIES MUST BE LOCATED APART FROM EACH OTHER
-  NORMALLY SEPARATE: FACILITIES SHOULD BE SEPARATED WHENEVER POSSIBLE.
-  COMPATIBLE: PROXIMITY TO OTHER FACILITIES NOT A MAJOR CONSIDERATION IN SITING
-  NORMALLY CLOSE: FACILITIES SHOULD BE LOCATED ADJACENT TO EACH OTHER WHENEVER POSSIBLE.
-  CLOSENESS ESSENTIAL: FACILITIES MUST BE LOCATED ADJACENT TO EACH OTHER IN ORDER TO FUNCTION PROPERLY

## Chart B-1: Airfield Functional Relationships

At most Air Force installations, the airfield is not only the dominant land use, or 25-40% of total base area, but is usually the very reason for the existence of the base. The airfield land use consists of the entire airfield pavement system (runway, taxiway, apron), related open space, navigational aids, and all imaginary airfield and airspace clearance surfaces. The size and configuration of an airfield largely depend on topography, climate, meteorologic factors, land availability, and weapons system characteristics.

Functional Relationships. The airfield is generally organized around a runway or runways. The airfield and the aircraft operations and maintenance facilities have a symbiotic relationship: spatial proximity is essential for each activity to operate efficiently.

Another critical functional land use relationship involves the airfield and open space. To maintain the clear zones, and imaginary airspace surfaces, certain areas of land beyond the paved sections of the airfield must remain free of obstructions.

### FUNCTIONAL RELATIONSHIPS ANALYSIS

LAND USE CATEGORY	
AIRFIELD	
AIRCRAFT OPERATIONS AND MAINTENANCE	●
INDUSTRIAL	◐
ADMINISTRATIVE	◑
COMMUNITY (COMMERCIAL)	◑
COMMUNITY (SERVICE)	◐
MEDICAL	○
HOUSING (ACCOMPANIED)	○
HOUSING (UNACCOMPANIED)	○
OUTDOOR RECREATION	◑
OPEN SPACE	●
WATER	○

- NO FUNCTIONAL LINKAGE
- INCOMPATIBLE
- ◑ NORMALLY SEPARATE
- ◐ COMPATIBLE
- ◑ NORMALLY CLOSE
- CLOSENESS ESSENTIAL

## Chart B-2: Aircraft Operations and Maintenance Functional Relationships

The Aircraft Operations and Maintenance category comprises all facilities that directly support the flying mission. It controls all activities taking place on the airfield and in the hangars, shops, and terminals adjoining it.

Functional Relationships. As noted in the preceding section on the airfield, aircraft operations and maintenance and the airfield are interdependent land uses. Neither one functions without the other.

The airfield is the only activity for which proximity to aircraft operations and maintenance is essential. It is important that the industrial land uses be near aircraft operations and maintenance for ease of cargo transfer. It is also important that aircraft operations and maintenance adjoin open space. Some facilities require open electronic communication or noise- reduction buffer space; others, like the control tower, must have a clear view.

The administrative land use is normally sited near aircraft operations and maintenance for ease of transferring information, people, and command decisions. Operations and maintenance should usually also adjoin community (commercial) facilities so that personnel have ready access to the various service clubs, the BX, indoor recreational spaces, and other community facilities. Proximity to outdoor recreational areas is also

### FUNCTIONAL RELATIONSHIPS ANALYSIS

LAND USE CATEGORY	
AIRFIELD	●
AIRCRAFT OPERATIONS AND MAINTENANCE	
INDUSTRIAL	◐
ADMINISTRATIVE	◑
COMMUNITY (COMMERCIAL)	◑
COMMUNITY (SERVICE)	◐
MEDICAL	◐
HOUSING (ACCOMPANIED)	◐
HOUSING (UNACCOMPANIED)	◐
OUTDOOR RECREATION	◑
OPEN SPACE	◑
WATER	□

- NO FUNCTIONAL LINKAGE
- INCOMPATIBLE
- ◐ NORMALLY SEPARATE
- ◑ COMPATIBLE
- ◒ NORMALLY CLOSE
- CLOSENESS ESSENTIAL

desirable to give people pre-work, lunch break, and/or post-work opportunities for exercise and social functions.

There is no need for aircraft operations and maintenance to be close to family or unaccompanied housing, medical areas, or community service land uses.

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## Chart B-3: Industrial Functional Relationships

Industrial facilities at Air Force installations include warehouses for various base activities, base maintenance and utilities functions, and base industrial services such as those belonging to transportation, communications, and civil engineering. They ordinarily fall into the following groups:

- o Base supply and equipment complex.
- o Fuel-related facilities.
- o Vehicle maintenance/motor pool complex.
- o Base civil engineer complex.
- o Open storage.
- o Utilities (infrastructure).
- o Emergency/disaster response facilities.
- o Ordnance and weapons storage areas.
- o Other industrial uses, such as photo lab, test cell, field training detachment, etc.

**Functional Relationships.** Proximity to air-craft operations and maintenance activities is very important to the industrial land use. This arrangement is functionally efficient for a number of reasons: (1) when supply and equipment facilities adjoin the air freight terminal, ship-ping distance and costs are as low as possible; (2) costs and environmental risks of pipeline transportation of fuel from the storage area to the aircraft operations and maintenance fueling stations are comparatively low; (3) vehicles and vehicle maintenance are as close as possible to

### FUNCTIONAL RELATIONSHIPS ANALYSIS

LAND USE CATEGORY	
AIRFIELD	
AIRCRAFT OPERATIONS AND MAINTENANCE	
<b>INDUSTRIAL</b>	
ADMINISTRATIVE	
COMMUNITY (COMMERCIAL)	
COMMUNITY (SERVICE)	
MEDICAL	
HOUSING (ACCOMPANIED)	
HOUSING (UNACCOMPANIED)	
OUTDOOR RECREATION	
OPEN SPACE	
WATER	

- NO FUNCTIONAL LINKAGE
- INCOMPATIBLE
- NORMALLY SEPARATE
- COMPATIBLE
- NORMALLY CLOSE
- CLOSENESS ESSENTIAL

the airfield, which uses several types of specialized ground vehicles, and to transients arriving by air and needing ground transportation; and (4) proximity of the base civil engineer and the fire and disaster teams to aircraft operations and maintenance is also desirable.

Family and unaccompanied housing and medical and community (services) are the land uses most disturbed by closeness to industry. They are usually kept separate to buffer people from the noise, smell, and other hazards associated with industrial activities.

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## Chart B-4: Administrative Functional Relationships

Administrative areas serve as the primary decision-making centers of an Air Force installation. The administrative land use category takes in military command and tenant activity management, wing/group headquarters, and civilian administrative activities. It also covers security police operations control, including gate/visitor management and military operations security.

**Functional Relationships.** Administrative functions are required by all on-base organizations and activities. The military uses of the administrative area should be located in a central area of the base for security purposes. This area should include headquarters and command office personnel. Proximity of staff and support functions will lead to the most efficient use of resources.

Central support facilities also include personnel pass and ID, staff judge advocate, social actions, public affairs, and reprographics. The public affairs office should have ready communication with headquarters. Reprographics, which should be sited near its major users, also belongs in the central support area. The latter two facilities should be located and placed in the central support area, near base head-quarters, for maximum efficiency.

### FUNCTIONAL RELATIONSHIPS ANALYSIS

LAND USE CATEGORY	
AIRFIELD	
AIRCRAFT OPERATIONS AND MAINTENANCE	
INDUSTRIAL	
<b>ADMINISTRATIVE</b>	
COMMUNITY (COMMERCIAL)	
COMMUNITY (SERVICE)	
MEDICAL	
HOUSING (ACCOMPANIED)	
HOUSING (UNACCOMPANIED)	
OUTDOOR RECREATION	
OPEN SPACE	
WATER	

- NO FUNCTIONAL LINKAGE
- INCOMPATIBLE
- NORMALLY SEPARATE
- COMPATIBLE
- NORMALLY CLOSE
- CLOSNESS ESSENTIAL

Other major administrative functions include indoor training and academic facilities, ideally sited near unaccompanied housing and the central support area, conference facilities, and research laboratories and test facilities.

Conference facilities can occupy a central or peripheral area, depending on whether or not conference activities are germane to the ongoing activities of the base. If they are located in a central area, a site near the visiting officers quarters/bachelor officers quarters (VOQ/BOQ) housing would be preferable. Research and test facilities may be best sited near the airfield or industrial uses.

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## Chart B-5: Community (Commercial) Functional Relationships

The community center is the central location for the shopping, service, recreation, and day-to-day living needs of base personnel, their families, and military retirees within the area. The Air Force land uses distinguish between the commercial community facilities (discussed here) and the service community facilities (discussed in the next section).

The community center is the marketplace of an Air Force installation. Site of the base exchange, (Bx), the commissary, clubs, and dining halls, personal services such as barber-shops, and many indoor recreational facilities, the community center serves most of the functions of Main Street, U.S.A., or Main Street Mall, for the civilian population.

**Functional Relationships.** The community (commercial) and community (service) land uses are very closely linked, and their physical proximity adds to the efficiency and livability of the base. The closeness of these two activities enables residents and customers from off the base to get all their errands done at one time. It also allows people to pursue many kinds of retail business, civic, entertainment, and recreation activities within the same locality, and it contributes to the morale of the installation.

### FUNCTIONAL RELATIONSHIPS ANALYSIS

LAND USE CATEGORY	
AIRFIELD	
AIRCRAFT OPERATIONS AND MAINTENANCE	
INDUSTRIAL	
ADMINISTRATIVE	
<b>COMMUNITY (COMMERCIAL)</b>	
COMMUNITY (SERVICE)	
MEDICAL	
HOUSING (ACCOMPANIED)	
HOUSING (UNACCOMPANIED)	
OUTDOOR RECREATION	
OPEN SPACE	
WATER	

- NO FUNCTIONAL LINKAGE
- INCOMPATIBLE
- NORMALLY SEPARATE
- COMPATIBLE
- NORMALLY CLOSE
- CLOSENESS ESSENTIAL

For those in unaccompanied and visitor housing, being within walking distance of the community center is essential. These personnel generally rely on mass transit or other non-automotive means of transportation. Good placement of facilities provides easy access from the unaccompanied/visiting quarters and dormitories to the commercial, recreational, and cultural areas of the base. Isolation is minimized. Opportunities for social interaction are enhanced. Pedestrian access also reduces the use of automobiles and optimizes land use.

Air Force families find closeness to the community center important as well. Their reasons may differ, as they are apt to use the service functions more heavily than the commercial areas, and have more access to automobiles.

Recreational uses, including the bowling alley, field house and/or gym, and swimming pool, may also be sited in or near the community center.

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## Chart B-6: Community (Service) Functional Relationships

The community (service) category contains the noncommercial activities that are important in day-to-day living. The complex composed of both these uses is the main location for the shopping, service, recreation, and other commercial, educational, and spiritual living needs of base personnel, their families, and military retirees within the area.

Facilities that comprise the service part of the community center are as follows:

- o Educational:
  - Schools (nursery, elementary, junior high, high school); and
  - Adult education facilities.
- o Other community facilities:
  - Post office;
  - Library;
  - Child care center(s);
  - Youth center;
  - Chapel; and
  - Religious education facilities.

Functional Relationships. Functional relationships between community (service) land uses and other base land uses are substantially the same as those of community (commercial) land uses. Close proximity between the areas is important, as it enables people to obtain goods and services from both places during the same errand.

### FUNCTIONAL RELATIONSHIPS ANALYSIS

LAND USE CATEGORY	
AIRFIELD	
AIRCRAFT OPERATIONS AND MAINTENANCE	
INDUSTRIAL	
ADMINISTRATIVE	
COMMUNITY (COMMERCIAL)	
COMMUNITY (SERVICE)	
MEDICAL	
HOUSING (ACCOMPANIED)	
HOUSING (UNACCOMPANIED)	
OUTDOOR RECREATION	
OPEN SPACE	
WATER	

- NO FUNCTIONAL LINKAGE
- INCOMPATIBLE
- NORMALLY SEPARATE
- COMPATIBLE
- NORMALLY CLOSE
- CLOSENESS ESSENTIAL

Proximity to family housing is more important than closeness to unaccompanied housing (a reversal of the commercial situation), as military families are heavier users of the community service center than are unmarried military personnel. The community service center should normally be separated from the airfield, aircraft operations and maintenance, and industrial land uses.

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## Chart B-7: Medical Functional Relationships

Many Air Force installations can supply people in need with hospitals for inpatient medical care, emergency care, surgery, and so on. Clinics are available for day-to-day outpatient medical care, extended care, optometry, dental care, and administrative uses. These facilities are also used by personnel living off-base and retired military staff.

The medical land use includes the hospital and/or clinics, the dental clinic, the BCE hospital maintenance shop, medical storage, and the veterinary care facility. The Red Cross may also be sited with this land use.

Functional Relationships. The health care land use is compatible with both accompanied and unaccompanied housing, the community center land uses, and administrative offices. It is thus most convenient to all base residents at home, to part of the workforce, and to anyone within the community center. It is also compatible with the outdoor recreation and open space uses.

The noise, traffic, and other disturbances caused by the airfield, aircraft operations and maintenance, and the industrial sector of the base make these uses poor neighbors for any medical activities. However, emergency transportation must have easy access to each of these areas.

### FUNCTIONAL RELATIONSHIPS ANALYSIS

LAND USE CATEGORY	
AIRFIELD	○
AIRCRAFT OPERATIONS AND MAINTENANCE	◐
INDUSTRIAL	◐
ADMINISTRATIVE	◑
COMMUNITY (COMMERCIAL)	◑
COMMUNITY (SERVICE)	◑
MEDICAL	
HOUSING (ACCOMPANIED)	◑
HOUSING (UNACCOMPANIED)	◑
OUTDOOR RECREATION	◑
OPEN SPACE	◑
WATER	□

- NO FUNCTIONAL LINKAGE
- INCOMPATIBLE
- ◐ NORMALLY SEPARATE
- ◑ COMPATIBLE
- ◒ NORMALLY CLOSE
- CLOSENESS ESSENTIAL

## Chart B-8: Accompanied Housing Functional Relationships

The family housing section is the area of an Air Force base that is most similar to the civilian environment. Accompanied housing consists of attached and detached residential units occupied by enlisted and officer families. This land use consists of the following types of housing: family housing: temporary lodging facilities (TLF); TLF support. Mobile home parks are also included in this category.

Family housing developments and TLF can take many forms. These include the traditional arrangement with individual dwelling units surrounded by their own yard areas, duplexes, the cluster and the planned unit development, the mixed-use development, and others.

**Functional Relationships.** Accompanied housing has its strongest functional relationship with the community (service) land use. Closeness to schools, child care facilities, the library and post office, and the religious center is essential to residents of family housing.

Proximity to the commercial community center, outdoor recreation, and open space is almost as important. The commercial community center, in both its abbreviated form as a neighborhood unit and its expanded BX/commissary/other shopping center form, offers a variety of essential goods and also an opportunity to socialize.

### FUNCTIONAL RELATIONSHIPS ANALYSIS

LAND USE CATEGORY	
AIRFIELD	○
AIRCRAFT OPERATIONS AND MAINTENANCE	◐
INDUSTRIAL	◐
ADMINISTRATIVE	◑
COMMUNITY (COMMERCIAL)	◑
COMMUNITY (SERVICE)	●
MEDICAL	◑
<b>HOUSING (ACCOMPANIED)</b>	
HOUSING (UNACCOMPANIED)	◑
OUTDOOR RECREATION	◑
OPEN SPACE	◑
WATER	◑

- NO FUNCTIONAL LINKAGE
- INCOMPATIBLE
- ◐ NORMALLY SEPARATE
- ◑ COMPATIBLE
- ◒ NORMALLY CLOSE
- CLOSENESS ESSENTIAL

Accompanied housing is normally close to the health care and administrative land uses. It is a large consumer of medical/dental services, and many of its residents work in the administrative area. Family housing's requirements for peace and quiet parallel those of the administrative sector. For this reason, it is unwise to site family housing near the airfield, aircraft operations and maintenance, and industrial sectors of the base.

Because the interests and habits of people living in accompanied and unaccompanied housing often differ considerably, the two areas are usually kept separate.

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## Chart B-9: Unaccompanied Housing Functional Relationships

There are several types of unaccompanied housing and related facilities that are found on Air Force installations: bachelor officer housing, the airmen's dormitories, and visiting officer and airman's quarters.

**Functional Relationships.** Bachelor and visitor housing have special proximity requirements. Closeness to the commercial community center is essential for both types of unaccompanied personnel, as it supplies an important social outlet. Single personnel of all ranks are the heaviest users of facilities and services (e.g., clubs, the commissary, the exchange(s), administrative offices, and indoor recreation facilities) present on the base. These personnel are less likely to have access to automobiles, and thus proximity increases their access to, and use of, the community commercial center.

It is important that unaccompanied housing also be located close to the community service center and the administrative areas. While military families are the heaviest users of the community service center, unaccompanied personnel do require access to the services located there. Many of the unaccompanied personnel often work in the administrative area and thus benefit from proximity to their place of employment.

The functional relationship with the medical center is compatible, but less important than the others listed above.

### FUNCTIONAL RELATIONSHIPS ANALYSIS

LAND USE CATEGORY	
AIRFIELD	○
AIRCRAFT OPERATIONS AND MAINTENANCE	◐
INDUSTRIAL	◑
ADMINISTRATIVE	◒
COMMUNITY (COMMERCIAL)	●
COMMUNITY (SERVICE)	◑
MEDICAL	◒
HOUSING (ACCOMPANIED)	◐
<b>HOUSING (UNACCOMPANIED)</b>	
OUTDOOR RECREATION	◑
OPEN SPACE	◑
WATER	◒

- NO FUNCTIONAL LINKAGE
- INCOMPATIBLE
- ◐ NORMALLY SEPARATE
- ◑ COMPATIBLE
- ◒ NORMALLY CLOSE
- CLOSENESS ESSENTIAL

Unaccompanied housing has no functional dependence on family housing. Since many of the interests and schedules of these groups of Air Force personnel are different, they are generally separated.

Unaccompanied housing is also functionally incompatible with the airfield, aircraft operations and maintenance, and the industrial land use for the same reasons as accompanied housing: namely, noise, vibration, traffic, and similar concerns.

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## Chart B-10: Outdoor Recreation Functional Relationships

Outdoor recreation facilities are very important to enhancement of the quality of life in the Air Force. There are three basic types of outdoor recreation spaces. Neighborhood recreation areas such as "pocket" playgrounds, parks, and picnic areas are the first type. Low density outdoor recreation areas feature activities engaged in by very small numbers of people at a time. They need little or no facility support and require little, if any, land disturbance. Examples include picnic areas, parks, running tracks, etc. Intensive use recreation areas serve activities involving large numbers of people at once and/or facilities that require substantial disturbance of the land. Examples include golf courses, swimming pools, and tennis courts.

**Functional Relationships.** Outdoor recreation is most closely linked, naturally, with open space. In one sense, open space may also function effectively as a low density recreation area (i.e., using open space for jogging, cross-country skiing, etc.). In other cases, land preserved for environmental reasons (e.g., flood plains) can also be used for such recreational uses as golf, baseball, etc.

Proximity to water can be very important, as water is the focus of many recreational activities. Closeness is also important between outdoor recreation areas and both the accompanied and unaccompanied housing areas, as leisure hours

### FUNCTIONAL RELATIONSHIPS ANALYSIS

LAND USE CATEGORY	
AIRFIELD	
AIRCRAFT OPERATIONS AND MAINTENANCE	
INDUSTRIAL	
ADMINISTRATIVE	
COMMUNITY (COMMERCIAL)	
COMMUNITY (SERVICE)	
MEDICAL	
HOUSING (ACCOMPANIED)	
HOUSING (UNACCOMPANIED)	
<b>OUTDOOR RECREATION</b>	
OPEN SPACE	
WATER	

- NO FUNCTIONAL LINKAGE
- INCOMPATIBLE
- NORMALLY SEPARATE
- COMPATIBLE
- NORMALLY CLOSE
- CLOSENESS ESSENTIAL

are generally spent at or near home. Thus, easy access to nearby outdoor recreation areas can greatly enhance the quality of life for Air Force personnel. It is often desirable to locate the athletic courts, particularly those for baseball and basketball, near the unaccompanied housing area, as unaccompanied personnel are the heaviest users of these facilities.

Outdoor recreation is compatible with all other base land uses except for the airfield. Because of the need for open space near the airfield, buffer areas have sometimes been used for recreation, but the activities are functionally incompatible. The airfield poses noise, vibration, and other hazards to individuals who seek recreational opportunities nearby.

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## Chart B-11: Open Space Functional Relationships

Open space both separates and defines the various sections of the base and creates the natural setting for all facilities. It can add immeasurably to a site's attractiveness.

Open space may be undeveloped for one of a number of reasons: it is necessary for buffer space between incompatible uses, is undevelopable due to environmental or physical constraints (flood plain, steep slope, etc.), or required for safety or security clearances.

Required buffer/clearance zones include the airfield's AICUZ and other buffers, roadsides, railroad rights of way, utility easements, hazardous waste safety limits, security buffers, and safety distances from ranges and weapons storage areas.

Greenbelts are linear open spaces designated through and between land use areas for intensive landscaping and preservation of existing vegetation, to buffer conflicting activities or transportation modes, and/or to connect nodes of outdoor activity, such as parks.

Open space can also meet positive human needs. The underlying justification for most open space has been on health grounds--fresh air, sunlight, recreation, physical exercise, and psychological release.

### FUNCTIONAL RELATIONSHIPS ANALYSIS

LAND USE CATEGORY	
AIRFIELD	●
AIRCRAFT OPERATIONS AND MAINTENANCE	◐
INDUSTRIAL	◑
ADMINISTRATIVE	◐
COMMUNITY (COMMERCIAL)	◐
COMMUNITY (SERVICE)	◐
MEDICAL	◐
HOUSING (ACCOMPANIED)	◑
HOUSING (UNACCOMPANIED)	◑
OUTDOOR RECREATION	●
OPEN SPACE	◻
WATER	◑

- ◻ NO FUNCTIONAL LINKAGE
- INCOMPATIBLE
- ◑ NORMALLY SEPARATE
- ◐ COMPATIBLE
- ◑ NORMALLY CLOSE
- CLOSENESS ESSENTIAL

Functional Relationships. It is essential that the airfield be bordered by open space to create the clear zones necessary to absorb the field's massive impacts on its environs. Likewise, open space is necessary for, and often collocates with, land used for outdoor recreation. The presence of open space is also important to residential uses, both military family housing and bachelor quarters.

To all other airbase land uses, open space is compatible and a prized asset. The location of open space is driven by the environmental characteristics of the land and the existing development pattern. Land located within defined flood plains and wetlands will usually remain as open space, unless developed for limited outdoor recreational uses. The runway clear zone and other limitations on development dictate what areas will be open space. It should be conscious base policy to attempt to locate small functional open spaces (i.e., small parks) in the activity centers of the base (e.g., administrative and industrial areas, commercial and service centers). Finally, the existing locations of the two housing areas can be used as the basis for locating greenbelt buffers between these areas and other land uses.

In the future land use plan, open space is to denote only land that is reserved for natural resources, buffers, or clearances, or that is otherwise unsuitable for development.

**Chart B-12:  
Water Functional Relationships**

Open water, in the form of ponds, major streams, and lakes on base, or shorefront areas along a river, large lake, or ocean, can be a tremendous asset to the installation's visual image and the mental well-being of its workers and inhabitants. Like open space, it may define the various sections of the base and help to create the natural setting for all facilities.

Functional Relationships. The water land use is functionally most compatible with open space and outdoor recreation.

As part of the open space land use, water may help to provide necessary buffer space between incompatible uses. It may be part or all of the environmental or physical constraint that renders a land use undevelopable. or it may be within an open space land use required for safety or security clearances.

If incorporated as part of a well-designed land use scheme. open water can add relaxation and aesthetic pleasure to people's perception of their surroundings, be they administrative or medical offices, community center structures, or housing. For example, scenic waterfront areas can be used to provide a very attractive setting for Air Force housing. Open water can serve as clear area and buffer for the airfield, but it is not compatible with aircraft operations because of the potential for bird-aircraft strike hazard.

**FUNCTIONAL RELATIONSHIPS ANALYSIS**

LAND USE CATEGORY	
AIRFIELD	○
AIRCRAFT OPERATIONS AND MAINTENANCE	□
INDUSTRIAL	□
ADMINISTRATIVE	□
COMMUNITY (COMMERCIAL)	□
COMMUNITY (SERVICE)	□
MEDICAL	□
HOUSING (ACCOMPANIED)	◐
HOUSING (UNACCOMPANIED)	◐
OUTDOOR RECREATION	◑
OPEN SPACE	◑
WATER	

- NO FUNCTIONAL LINKAGE
- INCOMPATIBLE
- ◐ NORMALLY SEPARATE
- ◑ COMPATIBLE
- ◒ NORMALLY CLOSE
- CLOSENESS ESSENTIAL

Chart B-13:  
Summary of Air Force Land Use Functional Relationships

	AIRFIELD	AIRCRAFT OPERATIONS AND MAINTENANCE	INDUSTRIAL	ADMINISTRATIVE	COMMUNITY (COMMERCIAL)	COMMUNITY (SERVICE)	MEDICAL	HOUSING (ACCOMPANIED)	HOUSING (UNACCOMPANIED)	OUTDOOR RECREATION	OPEN SPACE	WATER
AIRFIELD												
AIRCRAFT OPERATIONS AND MAINTENANCE	●											
INDUSTRIAL	◐	◐										
ADMINISTRATIVE	◑	◑	◑									
COMMUNITY (COMMERCIAL)	◑	◑	◑	◑								
COMMUNITY (SERVICE)	◑	◑	◑	◑	◑							
MEDICAL	○	◑	◑	◑	◑	◑						
HOUSING (ACCOMPANIED)	○	◑	◑	◑	◑	◑	◑					
HOUSING (UNACCOMPANIED)	○	◑	◑	◑	◑	◑	◑	◑				
OUTDOOR RECREATION	◑	◑	◑	◑	◑	◑	◑	◑	◑			
OPEN SPACE	●	◑	◑	◑	◑	◑	◑	◑	◑	◑		
WATER	○	□	□	□	□	□	□	◑	◑	◑	◑	◑

- NO FUNCTIONAL LINKAGE
- INCOMPATIBLE
- ◑ NORMALLY SEPARATE
- ◐ COMPATIBLE
- ◑ NORMALLY CLOSE
- CLOSENESS ESSENTIAL

---

## **D. Preparing the Functional; Relationships Map**

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### **4-5. Mapping Process.**

a. A preliminary step in preparing the functional relationship map is to obtain a copy of Tab C-1 (the installation's most recently updated base map). The planner should also obtain a complete list of facilities and structures (USAF Real Property Inventory Detail List, RCS HAF-LEE (AR) 7115). The list will be used to identify and label important facilities and structures located throughout the base. This identification is an important prerequisite to identifying major functional areas. The list will also be needed to determine the types of activities that occur within the major structures.

b. Identify Major Functional Land Use Areas. The first step is to identify the major functional land use areas, using the 12 land use classifications presented in Charts B-1 through B-12. Planners should start by consulting any existing planning work in Planning Assistance Team or Interim Planning Framework documents. Then examine Tab C-1. Look for obvious concentrations of facilities or activities that comprise each of the land use categories. Refer to the list of facilities by land use class that is presented in Appendix A or listed in the base comprehensive plan master statement of work (SOW).

## **FUNCTIONAL LAND USE AREAS**

(1) On an overlay sheet placed on top of Tab C-1, indicate concentrations or clusters of facilities known to comprise a particular land use class. If the planner decides to print Tab D-7, the overlay should consist of clear mylar. If Tab D-7 is not published but is instead used as an internal working map, then tracing paper or vellum can be used for the overlay.

(2) Once concentrations of facilities become apparent, they should be delineated with a thick black line. Judgment will be required in terms of what constitutes enough facilities to merit identification as a functional land use area. Clearly, a small shopette located in the middle of an accompanied housing area should not be mapped as a community commercial area. The perspective should be one of identifying concentrations where one type of land use is so dominant- that it determines the types of activities and the characteristics of the built environment (i.e., aesthetic, architectural, functional, etc.).

**c. Identify the Community Center.** Identification of the community center is extremely important. The Air Force land use classification distinguishes between commercial community activities and service community activities. Where possible, planners should attempt to distinguish the two different land use classes, although many of the facilities from the two uses are often collocated. One important reason for attempting to identify both types of centers is that often facilities in the community center are heavily

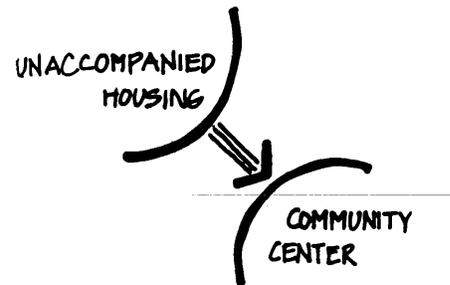
## **COMMUNITY CENTER**

used by persons living off the base, including military retirees shopping at the BX. Thus, transportation access to commercial activities is more important than for the service activities.

d. **Indicate the Nature of the Relationship Between Functional Land Use Areas.** Once the major land use areas have been identified, describe in graphic terms the characteristics of the functional relationships, if any, that exist between the different areas. Using the legend shown on Figure 4-3, indicate the strength of the functional relationship between different land use categories using the accompanying symbols. The primary relationships shown will involve adjacent land use areas. However, planners should also indicate significant functional relationships between separated but functionally related areas. Professional judgment will have to be used in deciding how many non-adjacent relationships to show.

(1) The triple, double, and single lines showing the recommended proximity relationship between different land uses should terminate in arrows that show the direction of the functional relationship, if it is not two-way (Figure 4-4). If space is available and the map does not become too cluttered, planners may wish to provide written labels for some of the significant functional relationships that describe the properties of flows between functional land use areas.

(2) There is a very strong relationship between the base transportation system and the base land



**Figure 4-4. One-Way Functional Relationship**

use pattern. The transportation system determines to a very significant extent the accessibility and efficiency of flows between different land use areas. For this reason it is recommended that planners also show on the functional relationship map major and minor auto circulation routes, and pedestrian routes and flows.

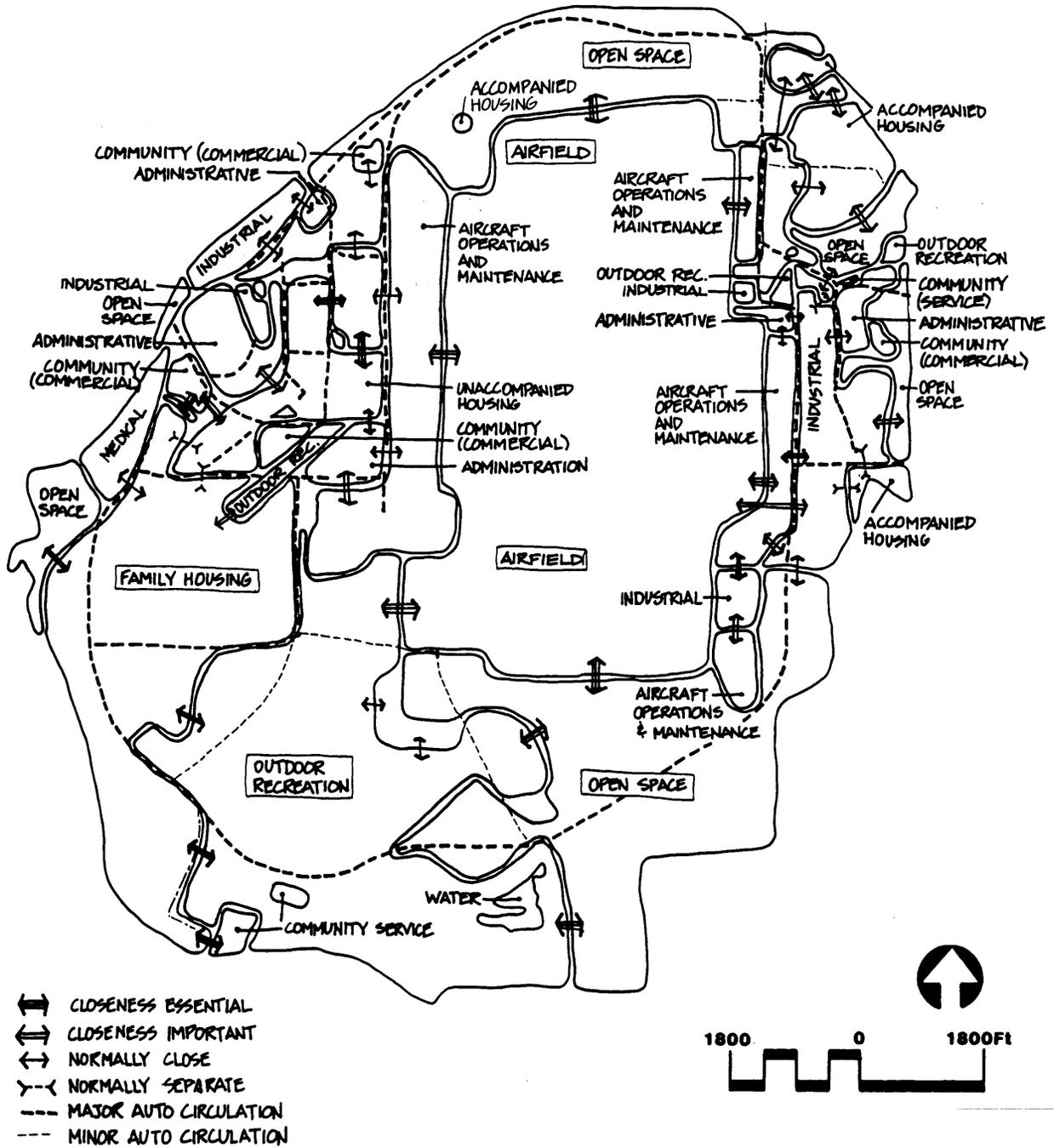
(3) The planner at this point should review the overlay to see if there are any deviations from the spatial relationships described in the land use section. It is important to note land use area combinations that are not located next to each other, but which should be (according to tables provided with each land use category).

(4) At this point the functional relationship map should resemble Figure 4-5. The major functional land use areas have been delineated, and the character of the functional relationships has been shown graphically. The major and minor transportation routes should show clearly the pattern of motor vehicle and pedestrian flows on the base.

(5) The functional relationship map is used to identify problems and opportunities incorporated within the future land use plan. Planners should examine the map to see if situations exist where functionally related land uses or similar

Figure 4-5

Functional Relationship Map



activities are located too far from each other. Planners should be alert to opportunities to consolidate compatible activities within functional land use areas. Finally, planners should look for individual functions or structures that are located away from the functional area closely related to them.

**e. Identify Major Structures within Functional Land Use Areas.**

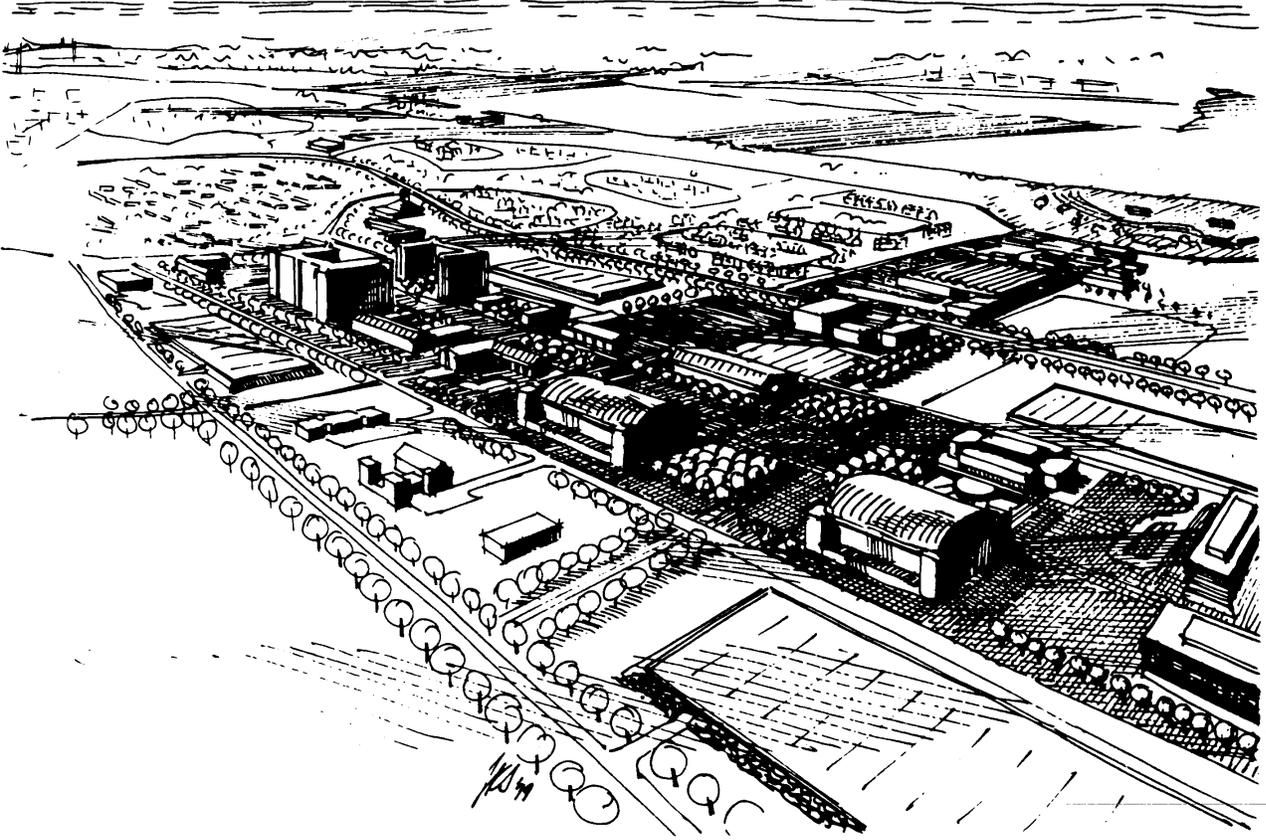
## **STRUCTURES**

(1) Once the functional land use areas have been delineated, the major structures and activities within each functional land use area should be identified. It is recommended that the outline of each functional area be drawn on a separate sheet of vellum. The major facilities and structures located within each functional land use area should then be labeled on these other drawings, which can serve as working maps to provide additional detail to the overall functional relationship map.

(2) Planners should consider identifying the major activities and structures within some of the larger functional land use areas. These include such land use categories as administrative, community commercial, community service, industrial, and aircraft operations and maintenance- areas, which have the largest number of different activities performed within them. This diversity implies the existence of heavy or highly differentiated uses within the land use category.

(3) This level of analysis is required in developing coherent plans for activity complexes having either heavy flows between activities located within the complex (i.e., the industrial area), or heavy flows into and out of the complex (e.g., the community center).

(4) Within major land use concentrations, this analysis indicates the important flows-and dependencies that occur at major activity centers. The details of this analysis may indicate potential opportunities for consolidating functionally related or compatible activities within a single structure.



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**Chapter 5: Preparing the Future Land Use Plan**

# CHAPTER 5: PREPARING THE FUTURE LAND USE PLAN

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## A. Approach to the Future Land Use Plan

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### 5-1. Key to the Land Use Plan.

a. The key step in the planning process is to create a future land use plan. This is the document that will present in graphic form what the plan describes in written form: the desired future land use pattern of the Air Force installation. Appendix B shows an example of the future land use plan.

b. The drafting of the future land use plan is an integrative process in which the planner considers a wide range of information and attempts to meld it into a coherent document. In a fundamental sense, this part of the land use process is a combination of art and science. The "art" of land use planning in large part relates to the attempt to answer the question of what we want the future to bring. This is clearly a value-laden and subjective question that attempts to reconcile competing goals and objectives about a future, desirable end-state (i.e., what constitutes a desirable and efficient land use pattern at some point in the future).

c. The "science" of land use planning comes from the need to consider and incorporate into the plan both operational requirements and the opportunities and constraints of the natural,



Land use planning is  
an art and a science.

built, and sociocultural environments. Planning principles concerning the compatibility of different land uses, energy conservation, and the functional relationship of different land uses will all tend to shape a normative land use pattern. Similarly, the location of utilities, the characteristics of the on-base transportation system, and the location of sensitive environmental features will also direct land use into and away from certain areas.

## 5-2. Sample Situation.

a. The drafting of the future land use plan will more likely be an evolutionary process in which alternative plans are drafted and then reviewed and modified based on information already assembled. For example, the planner may map on a preliminary basis a larger community center based on a goal of consolidating presently scattered facilities in a more functional area, and on the clearly recognized need to expand the current BX and commissary facilities.

b. Following this initial step, the planner would then examine other information sources such as the functional relationship map, pro-posed capital improvements, the transportation plan, proposed demolitions, etc. to see how they would affect the proposed community center area. Based on this use of other knowledge and the input from other base personnel, the planner could then maintain or amend the dimensions of the proposed future community center area. This process would be duplicated for other areas of the base.



Land Use Planning is an evolutionary process

c. The implication of the above discussion is that it is difficult to give a precise "how to" method for developing the future land use plan. However, descriptions of basic steps that should be used in developing the future land use plan, along with questions and considerations that base planners should incorporate into their decision-making process, are presented in the next sections.

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## **B. Assemble Data Inputs**

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5-3. At this point in the process, the base planner will need to assemble and integrate the information from the following sources in pre-paring the future land use plan:

- o The land use planning goals and objectives.
  
- o The needs assessment, which identifies key issues and problems which must be addressed through land use planning.
  
- o The analysis of functional relationships.
  
- o The analysis of constraints and opportunities.
  
- o Tab D-I, Existing Land Use.

- o Other BCP components, particularly the transportation, AICUZ, long-range facilities development, capital improvement, utilities, and natural resources plans.

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## **C. Compile Preliminary Plan of Future Land Use Areas**

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5-4. At this point, a preliminary plan of future land use areas is developed. This should be done on a copy of Tab C-1. It should be based on the composite overlay of the functional relationship, existing land use, and constraint maps.

**DRAFT PLAN  
ON TAB C-1**

5-5. Once this initial plan has been completed it should be reviewed by civil engineering personnel, who must take into explicit consideration the assembled sources of information noted above.

5-6. The initial plan should be further amended based on the following questions:

- a. Land Use Goals and Objectives.
  - Will the proposed land use pattern result in the achievement of the land use goals and objectives?
  - Would the proposed land use pattern be functionally efficient and effectively support the base mission?
  
- b. Needs Assessment.
  - Are there specific. known needs that will have to be met to ensure the

base's ability to perform its mission (e.g., a new hangar, increased air-craft operations and maintenance facilities, etc.), or to enhance the quality of life (e.g., shortage of family housing units, deficit in supply of recreational resources, etc.)?

- Are there specific construction projects (e.g., construction of new buildings, relocation of existing activities, etc.) required to meet observed needs?
- If so, where will these structures, facilities, etc., be located and how will they affect the existing land use patterns?
- Will the proposed plan solve the identified problems?

c. Functional Relationships.

- Are there any instances of functionally related land uses that would benefit from increased proximity?
- Are there any obvious examples of incompatible land uses located next to one another?
- Are there instances where the efficiency of flows between functionally related land uses could be improved other than by increased proximity (e.g., provision of pedestrian walkways, improvement of the transportation system)?

- Are there instances where related activities within a given land use type are dispersed from each other and would benefit from consolidation?
- d. Planning Factors.
- Are there opportunities to enhance physical security and protect against terrorism?
  - Are there opportunities for combining functionally related or compatible uses within a single structure?
  - Are demolitions of obsolete structures planned such that developable land may become available?
  - What are the constraints on development imposed by environmental factors?
  - Are there important characteristics of the base and its resources that should be preserved?
  - What is the location and capacity utilization of on-base utility systems? Are they capable of accommodating additional development?
- e. Other Components of the BCP.
- Is expansion planned for on-base utility systems? If so, what areas of the base will be served?
  - What new construction and replacement activities are planned under the long-range facilities development plan?
  - Does the transportation plan identify deficiencies in the on-base transportation system? If so, what changes are recommended?

- What facilities are recommended under the short-term capital improvement plan? Where would they be located?

5-7. The above list of questions is at best a brief indication of all the considerations that base planners will have to take into account in amending and shaping the preliminary draft of the final land use plan. As the draft plan is reviewed and modified, new considerations will arise that will have to be addressed. As planners continue to examine the preliminary plan in light of the above information sources, the final land use plan will begin to emerge.

5-8. Input from other groups will be crucial to preparing a future land use plan that is a true consensus document the command structure will be willing to adopt and implement. A preliminary version of the final land use plan should be circulated to various organizations on the base for their review and comment. Those receiving preliminary versions should include:

- o The installation commander.
- o The base civil engineer.
- o Commanding officers and representatives of tenant units located on the base.
- o Representatives of all major base organizations.
- o Directors or managers of major on-base facilities such as the BX, the commissary, hospital, school, etc.

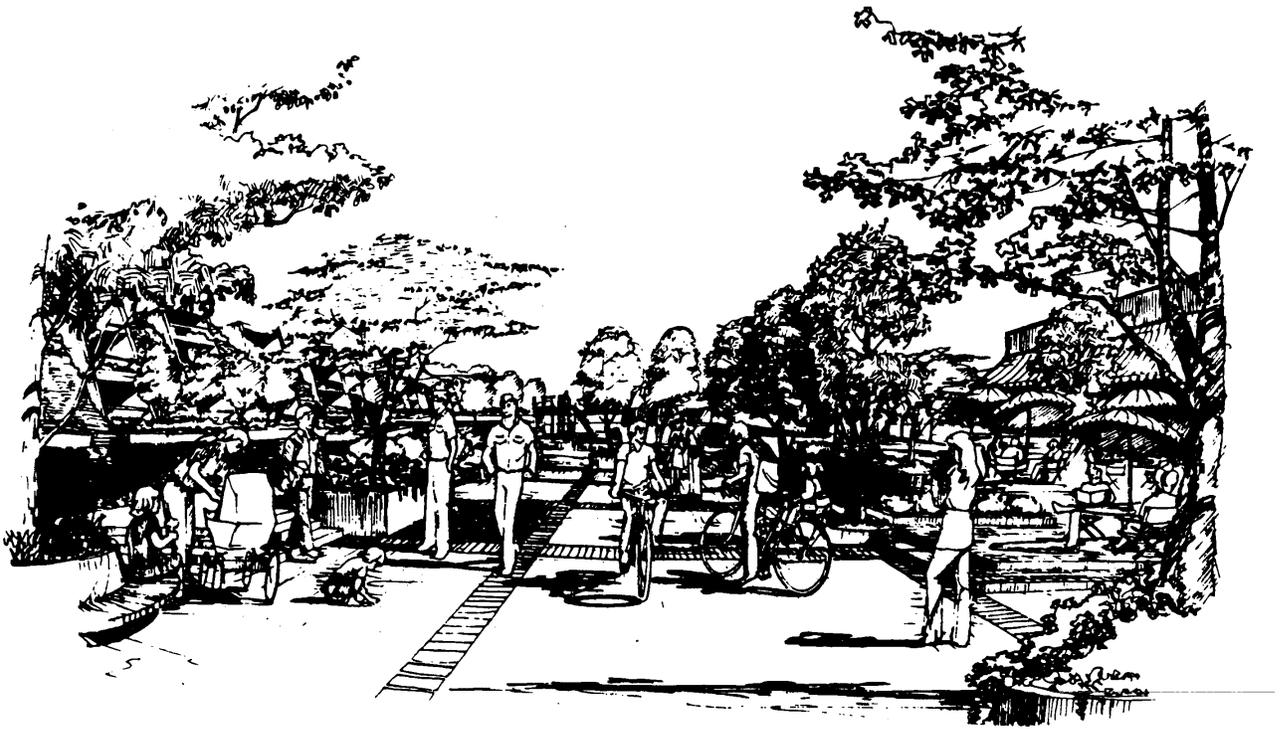
## **DRAFT FUTURE LAND USE PLAN**

## **REVIEW AND COMMENT**

- o The base communications (information system) organization.

5-9. After receiving this input, the base planner is then responsible for producing the final version of the future land use plan (Tab D1.1). This plan must be prepared in accordance with the requirements of the Air Force's Base Comprehensive Plan Master Statement of Work. This document contains specific standards concerning size, legends, colors, symbols, and information content of this Tab.

## **FINAL FUTURE LAND USE PLAN ON TAB D-1.1**



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## Chapter 6: Relating to Neighbors & the Region

# CHAPTER 6: RELATING TO NEIGHBORS AND REGIONS

## A. Bordering Land Uses

### 6-1. Attitude and Issues.

a. An air base is a fairly complex community in its own right. It has a full range of land uses and services and, in some cases, would be indistinguishable from a small to mid-size community were it not for the airfield and perimeter fence. Because it is a military base, and very self-contained, planners can easily omit from consideration anything that happens beyond the fence. After all, the base planner has little or no direct influence over development occurring beyond the boundary. However, an Air Force installation clearly has a significant indirect effect on land use adjacent to the base, and ignoring the interactions between the base, bordering land uses, and regional trends would be shortsighted.

b. The base planner has to be aware of all facets of the land use situation in the adjacent area and in the larger surrounding region (Figure 6-1). Issues that require consideration are as follows:

#### (1) Adjacent land use.

- o What are the current land uses adjacent to the base? What trends exist to indicate the types of future adjacent land uses?

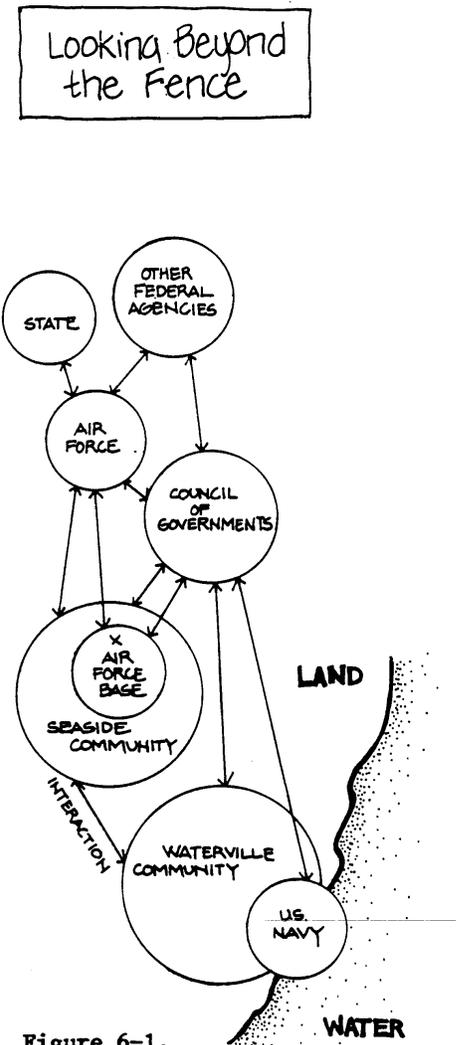
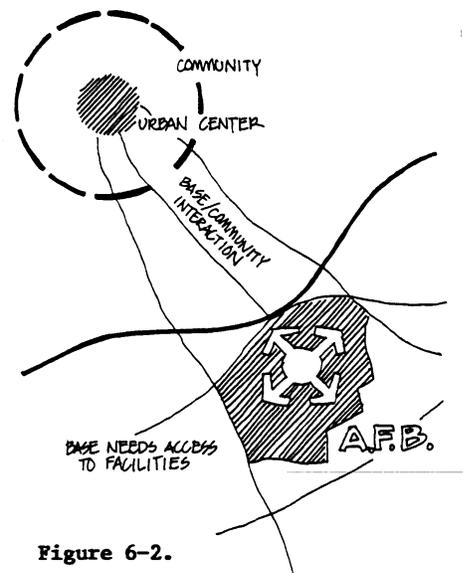


Figure 6-1.  
Regional Interaction

- o Do these current land uses create any problems with regard to the mission, either at present or in the future?
- o Are adjacent land uses compatible with Air Force plans for the base edges?
- o What are future plans for undeveloped near-base properties?
- o What are the land use policies and plans as expressed in zoning ordinances, comprehensive plans, etc?
- o What plans or proposals exist for future development, provision of infrastructure, etc., that could significantly change the type and intensity of adjacent land uses?

(2) Regional land use.

- o Is the base in the path of a clearly definable growth corridor?
- o What is the base's proximity and access to regionally important systems (e.g., transportation, sewer, water, electricity, gas, etc.) (Figure 6-2)?
- o What is the setting of the base within the regional land use pattern (e.g., urban, suburban, suburban/rural fringe, rural agricultural, etc.)?



**Figure 6-2.**  
**Regional Context**

- o What are the recommendations, projects, etc., contained in regional plans (i.e., solid waste management plans, water quality management plans, transportation plans, etc.)?
  
- o What access does the base have to regionally important facilities and services (i.e., central business district of an urban center, museums and other cultural facilities, shopping malls, mass transit stations, major out-door recreation facilities)?
  
- o What are the dominant regional land uses?

c. Originally selected for their rural or hinterland surroundings, air base sites are increasingly surrounded by suburban growth from once distant urban centers. Also, the air base is a magnet of some size, attracting residential and commercial development to serve the base and its employees and residents.

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## B. The Larger View of the Base within the Region

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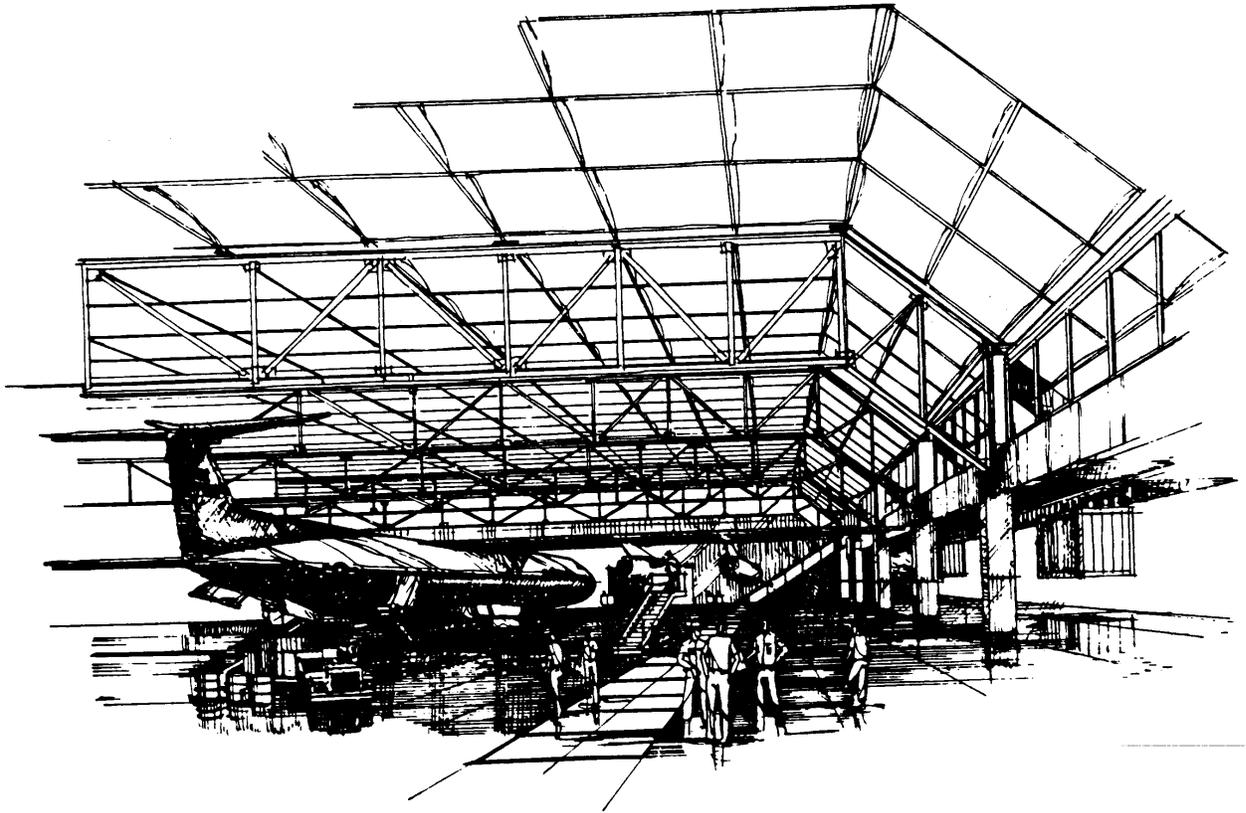
### 6-2. Working with Neighbors.

a. In the same way the planner endeavors to retain the flexibility to accommodate changing missions or manpower surges on base, he or she must work with planners in neighboring jurisdictions to ensure that development around an air base does not strangle it by creating access

Maintain lines of  
Communication  
with local Planners &  
Public officials.

problems or generating incompatible or dangerous uses that could interfere with base operations. Likewise, keeping the civilian planners aware of the base's goals, objectives, and plans for the future gives them information they can use to foster compatibility along the boundary between military and private property.

b. The process of developing and implementing a land use plan also requires the establishment of a continuing working relationship between the base planner and planners, public officials, etc., of neighboring governmental units. Just as land use planning is more than just producing the plan, relating to neighbors and the region is more than simply reviewing local land use plans from time to time.



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## Chapter 7: Making the Plan Work

# CHAPTER 7: MAKING THE PLAN WORK

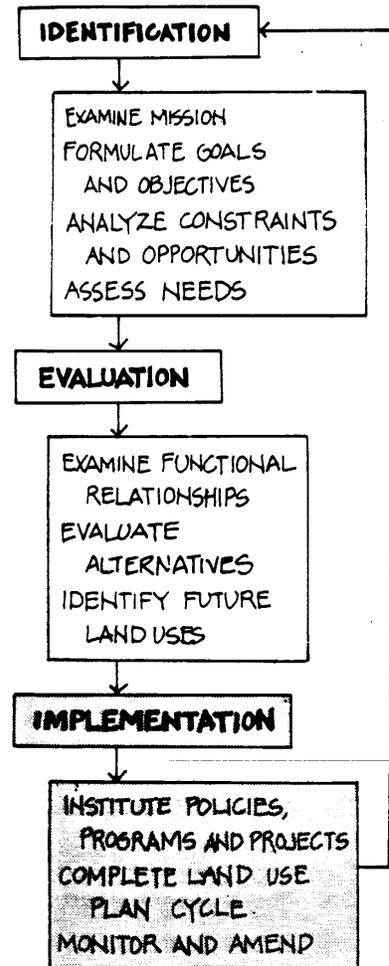
## A. Implementation

### 7-1. Third Phase of Air Force Planning.

a. The final part of the Air Force land use planning process is the **Implementation** phase. This phase marks the transition of land use planning from development of a plan to the process of implementing it. Three major activities are conducted during this phase:

- o Developing specific policies, programs, and projects that will implement the future land use plan.
- o Incorporating the land use plan into the BCP.
- o Controlling future on-base development by ensuring that future development is consistent with the land use plan; in particular, that facility siting and the provision of infrastructure conform to the plan.

b. It is important to note that land use planning for an Air Force base will not take place as a completely independent task, but will instead be part of the overall base comprehensive planning process. Similarly, the land use plan will be integrated into the BCP.



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## **B. Developing Policies, Programs, and Projects**

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**7-2. Timing and Execution.** The development of specific policies, programs, and projects to implement the land use plan will occur throughout the development of the plan. As noted earlier in Chapter 3, the process of assessing needs will naturally lend itself to the subsequent development of specific implementation measures. Similarly, the analysis of functional relationships may also lead to the identification of obvious ways of enhancing flows between land use areas.

**7-3. Sources of Information.**

a. The base planner at this point should assemble the future land use plan and the statement of land use goals and objectives and begin to develop the specific policies for implementing the land use plan. A number of additional sources of information will have to be referred to in developing these implementation policies:

- o Five-year Defense Program.
- o Other documents containing proposed capital development projects.
- o Needs assessment.
- o Base profile.
- o Interim planning framework.
- o Planning assistance team (PAT) report, if available.
- o Natural Resources Plan.
- o Off-base plans and policies.

b. The development of policies, programs, and projects will be a collaborative effort which requires input from the base facilities board, the base civil engineer, the base commander, and representatives from base organizations which will be affected by land use decisions. This effort will likely go through several iterations as the base planner or the base civil engineer develops specific recommendations for policies, programs, and projects, and reviews them with the other relevant parties. Planners should refer to the other BCP components to ensure that the initial policies, etc., are consistent with these elements. Where they are not, modifications will be required.

**7-4. Base Policies.** The land use goals and objectives developed during the Identification phase will be the basis for developing more specific measures for implementing them. Each base will have to develop its own set of policies, programs, and projects that are responsive to the unique characteristics found at the installation. It is thus impossible to provide in this document a set of overall Air Force-wide measures commonly used to implement a land use plan. Representative examples of land use policies are presented below.

### **Policies**

Policy: Eliminate conflicting land uses that adversely impact family housing.

Project: Functions located in buildings 1170 and 1171 must be moved and the structure demolished.

Project: Noise attenuation screens should be constructed to reduce sound levels transmitted to family housing areas.

Policy: Provide for better use of the floodplain that traverses the housing area.

Project: Provide court and turf games in the floodplain that would expand the present recreation opportunities while withstanding periodic inundation.

Policy: Provide an additional 110 units of military family housing.

Project: Construct housing at present site of the family camp and the ball fields. Move ball fields and camp to a more centralized location.

Policy: Expand supply of unaccompanied housing.

Project: Construct new airmen dorms near the existing airmen's dining hall.

Policy: Relocate all recreation facilities according to functional groupings.

Project: Relocate playing fields from west of the flight line to the housing areas.

Project: Relocate athletic courts to the hospital, family housing, and bachelor housing areas.

Policy: Consolidate industrial land uses as much as possible to lower the number of locations from the current five.

Project: Construct a new building which will house the BCE communication maintenance facility, the BCE covered storage shop, and the vehicle maintenance shop, which are currently found at separate locations.

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## C. Incorporate the Land Use Plan into the BCP

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### 7-5. Land Use Planning- Part of the BCP.

a. Once a comprehensive set of policies, programs, and projects has been developed, the land use plan must be incorporated into the larger BCP. As noted previously, land use planning will not be performed independently of other planning activities, but will instead be a part of the entire BCP planning process.

b. It is imperative that planners ensure that the land use plan is consistent with the other components of the BCP, particularly the natural resources plan and the transportation plan. The natural resources plan shows the present use of undeveloped land and major constraints such as soil capabilities, flood- plains, wetlands, habitats, and unique natural

Land use planning is not independent of the larger BCP planning process.

areas. The on-base transportation system will affect access of different land uses to each other, and to users coming from off the base.

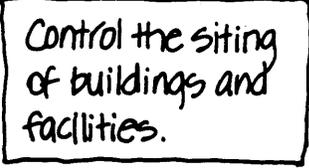
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## D. Monitor On-Base Development

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### 7-6. Using the Plan.

a. The final part of the land use planning process will be to continually implement the plan (along with the rest of the BCP) as a means of controlling on-base development. The most important role of the land use plan will be to ensure that new buildings and facilities are located according to the future land use plan and adopted base policies. It will also be used so that the future development of transportation improvements, utilities, etc., conforms to the plan. and existing beneficial uses are retained.



Control the siting of buildings and facilities.

b. The land use planning process incorporates several feedback loops that represent the need to continually update the plan. As new facilities are constructed and improvements occur, the plan will have to be modified to reflect these changes.

c. Once a plan has been completed and approved. the battle has only been partly won. The true test comes in living with the plan and using it as the primary means to guide future development of the installation. Planning history is full of examples of elaborate, finely detailed plans that were essentially obsolete

from the moment they were approved. In numerous other instances, plans have become "shelf" documents that are rarely, if ever, used for their intended purpose.

Plans must be more than shelf documents: they must be implemented.

d. A key point to remember is that base comprehensive planning is an ongoing process that continues once the initial plan has been conceived and adopted. A plan in published form is necessarily time-limited as an expression of the collective thoughts of the affected community on its desired end state. In order for a land use plan to have the intended effect of guiding an installation's future development, provisions must be made for updating the plan on a continuing basis.

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## E. The Organic Plan

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### 7-7. Plan Updates.

a. The process of implementing the land use plan on an ongoing basis must be accompanied by a corresponding effort to keep it relevant. The planning process must be able to accommodate changing conditions on a base, incorporate them into the plan, and change plan recommendations where required.

b. Changes in mission can have significant impacts in terms of the facilities required to support new directions. Technological advances in weapons systems will clearly change the type

of support facilities required on a base, for example. Similarly, expansion of an installation's mission and the corresponding assignment of substantial numbers of new military personnel to a base will place significant new demands on community center, housing, medical, and other facilities.

c. Advances in technology, the evolution of the surrounding region, and the accumulation of new information can all have impacts that must be accounted for in the land use plan. For example, advanced in building construction techniques and energy management may make it possible to consolidate activities within a new structure that could not have been considered before.

d. Likewise, a decision by an adjacent regional government to extend utility lines out toward the base would have growth implications that would have to be considered by the Air Force installation. Such a decision could force the base to reconsider the type of long-range development proposed for areas near the base's border and make it more compatible with future off-base development.

e. It is extremely important that a planning process include a feedback loop so that new information can be incorporated. The acquisition of fresh data may require planners to reformulate some of the original goals and objectives in order to more accurately encompass the needs of the changing Air Force community. Adopting a particular policy or program called for by the

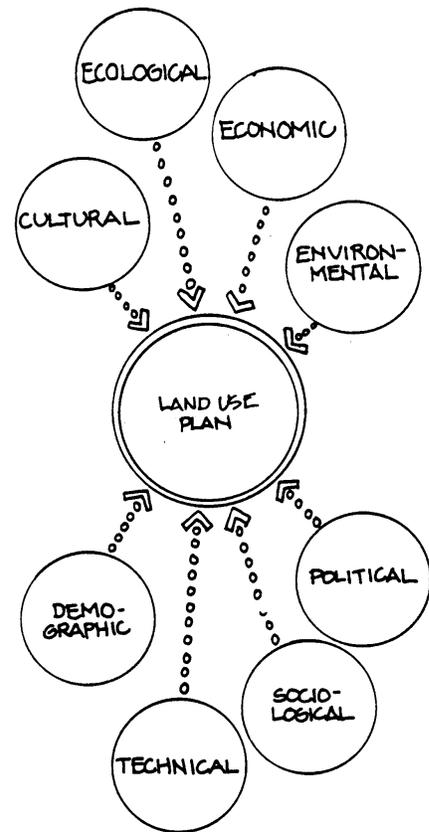
Importance of feedback  
in updating the plan

land use plan may lead to the discovery of unanticipated adverse impacts that have to be corrected, or it may turn out that a particular project has created an unanticipated opportunity for improving the base's quality of life, a benefit that can be realized with minimal expenditure for new facilities.

**7-12. Annual Reexamination of the Plan.**

a. The planning process should include an annual re-examination of the plan. The primary vehicle for doing this is the base facilities board, with the primary input coming from the base civil engineer and the base planner. The goal should be to improve the plan by keeping it responsive to changing conditions and needs. Opinion and input should be solicited from all sectors of the base community, so that the board can maintain a perspective on the points of view of all affected. Influences on the plan are shown in Figure 7-1.

b. It should be noted that there is a distinction between amending a plan in light of new information or changed circumstances and altering the plan because somebody finds it difficult to live with the recommendations. The former is a legitimate exercise that must be a part of any planning process. The latter may lead to a misshapen and irrelevant document that bears no relationship to the needs of the Air Force community. Plans must be adhered to in order to guide an installation's development toward a well-ordered future.



**Figure 7-1. Influences on the Plan**

Avoid the temptation to modify the plan too often.

c. The ultimate test of any plan is the extent to which an Air Force installation applies it on a continuing basis as the guiding force for on-base development. The plan must be relied upon for the resolution of siting issues, enhancement of the functional efficiency of the land use patterns, and improvement of the quality of life of base residents and employees. The challenge is to comply with the plan's requirements and update it to reflect changing conditions, all without sacrificing the plan's vision and coherence.

## **ADHERING TO PLAN**

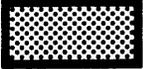
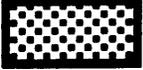
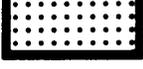
- A: Land Use Categories-Facilities List**
- B: Example Land Use Plan**
- C: Long-Range Facilities Development Plan**
- D: Model Statement of Work for a Contracted Land Use Plan**
- E: Planning Reports and Documents**

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## **APPENDICES: A through E**

# APPENDIX A: LAND USE CATEGORIES- FACILITIES LIST

## Land Use Categories

Land Use Categories	Color	Pattern*
Airfield	White	None
(runway/taxiway/apron)	Brown	
Aircraft Operations/Maintenance	Dark Blue	
Industrial	Grey	
Administrative	Orange	
Community (Commercial)	Red	
Community (Service)	Pink	
Medical	Violet	
Housing (Accompanied)	Yellow	
Housing (Unaccompanied)	Yellow Ochre	
Outdoor Recreation	Dark Green	
Open Space	Light Green	
Water	Light Blue	

- To be used for black and white or reproducible copies.

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## Facilities List

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The following list of facilities is not all-inclusive, but is meant to provide examples of the types of facilities found in each land use category.

### 1. Airfield.

#### Facility

Runway  
Overrun  
Taxiway

#### Facility

Apron  
Arm/disarm pad  
Various navigational aids/air  
traffic control facilities.

### 2. Aircraft operations and Maintenance.

#### Facility

Aircraft Hangar  
Aircraft Organizational Maintenance  
General Purpose Shop (A/C)  
Maintenance Control Office  
AGE Shop Maintenance  
Engine I&R  
Fuel Maintenance Dock  
Corrosion Control Facility  
NDI Shop  
Avionics Shop  
Field Training Detachment (on flightline)  
Base Operations  
Crew Readiness Facility

#### Facility

Helicopter Operations  
Control Tower  
Weather Facility  
Munitions Load Crew Training Facility  
Fire Station-Crash/Rescue  
Air Freight Terminal  
Squadron Operations/Flight Training  
Aircraft, Wash Rack  
Sound Suppressor  
Aircraft Maintenance  
Missile Launch Sites  
Radar/Aircraft Guidance Systems  
Primary Radar Station Facilities

### 3. Industrial.

#### Facility

Base Supply Administration  
Warehouse, Supply & Equipment  
Shed, Supplies & Equipment  
Open Storage, BCE  
Commercial Transportation  
Vehicle Operations Administration  
Vehicle Maintenance Shop  
Refueling Vehicle Shop  
Vehicle Parking Shed  
Vehicle Operations Parking

#### Facility

Vehicle Operations Storage  
Vehicle Wash Rack  
Open Storage, LGT.  
Base Engineering Administration  
BE Maintenance Shop  
BE Covered Storage  
BE Storage Shed  
BE Pavements & Grounds  
BE Open Storage  
Communications Maint. Facilities

**Facility**

Heating Plant  
Central Refrigeration Plant  
Sanitation Facility  
Flight Simulator  
Water Facilities  
Fire Station-structural  
Locomotive Maintenance  
POL Operations Building  
Truck Fill Stand  
Fuel Storage  
Operating Storage  
Field Training Detachment (SPs)  
Small Arms Training  
Small Arms Range

**4. Administrative.**

Audio Visual Facilities  
Television Production Center  
Education Center  
Social Action Facilities  
Wing/Group Headquarters  
Area Defense Council Office  
Law Center  
Command Post  
Telecom Center  
CPBO  
Civilian Personnel  
Family Services

**Facility**

Test Cell  
Disaster Preparedness  
Fire Training Facility  
Kennel/Kennel Support  
Reserve Fire Team Facilities  
Base Printing Plant  
Armament Maintenance/Storage  
Photo Lab  
MARS Radio  
Electric Substations  
Survival Equipment Shop  
Other Utility Facilities  
Weapons/Munitions Storage Area  
Various Research Facilities/Labs

Family Housing Management  
Red Cross  
Warehouse, Forms & Publications  
DCO Staff  
DCM Staff  
SP Group Headquarters  
Security Operations  
Central Security Control  
SP Control & ID  
Traffic Check House  
Data Processing Pit.

**5. Community (Commercial).**

<b>Facility</b>	<b>Facility</b>
Commercial	
Clothing Sales'	Exchange Service Station
Bank	Exchange laundry
Credit Union	Exchange Sales Store
Thrift Shop	Exchange Set-ice Outlet
Commissary	Exchange Warehouse
Cold Storage	Exchange Maintenance Shop
Exchange Branch	Exchange Administration
Exchange Cafeterias	
Clubs/Dining	
Airmens' Club	Airmens' Dining Hall
NCO Club	Dry Storage, DH Support
Officers' Club	
Indoor Recreational	
Gym	Recreation Center
Fieldhouse	Arts-Crafts Center
Theater	Auto Hobby Shop
Bowling Center	Youth Center

**6. Community (Service).**

Educational Dependent Schools

Other Community Facilities

<b>Facility</b>	<b>Facility</b>
Post Office	Chapel
Library	Religious Education Center
Child Care Center	Education Center

**7. Medical.**

Facility	Facility
Veterinarian Facility	Medical Storage
Hospital & Dental Clinic	

**8. Housing (Accompanied).**

**Facility**

Family Housing

TLF

TLF Support

**Facility**

Trailer Court

**9. Housing (Unaccompanied).**

**Facility**

Bachelor Housing

BOQ

UEPH

**Facility**

Visitor Housing

VOQ

VAQ

**10. Outdoor Recreation.**

**Facility**

Tennis Courts

Baseball, Junior Fields

Football Fields

Track

Softball Fields

Recreation Court

Recreation Pavilion

Gold Course

Golf Clubhouse

**Facility**

Riding Stable

Outdoor Pool

Swimmers' Bath House

Fam Camps

MWR Supply/Storage

Outdoor Ranges

Parks/Picnic Areas

Beaches

Outdoor Drill, Training Areas

**11. Open Space.**

a. Conservation areas, forest stands, grazing areas.

b. Required buffer space--safety clearances, security areas, utility easements.

**12. Water.**

On-base ponds, lakes, major streams.

## **APPENDIX B: EXAMPLE LAND USE PLAN**

This appendix illustrates key components of a land use plan for a mythical place: Hometown Air Force Base. Comments to the reader are boxed to distinguish them from the Hometown AFB illustration. The basic outline of a land use plan is followed:

1. Planning Process
2. Plan Goals and Objectives
3. Regional Profile
4. Existing Conditions
5. Constraints, Deficiencies, and Opportunities
6. Future Land Use Plan

Each base will have different circumstances than those discussed here. This appendix is presented as an example, not as a prototype of how all land use plans must be done.

### **LAND USE PLAN FOR HOMETOWN AIR FORCE BASE**

This component of the base comprehensive plan describes the land use planning process, land use goals and objectives, the regional profile, existing land use conditions, and significant constraints to and opportunities for future land use development at Hometown Air Force Base.

#### **1.0 LAND USE PLANNING PROCESS**

In order to develop a frame of reference for evaluating existing land uses and recommending future land uses, a land use reconnaissance was undertaken at Hometown to define major land use categories and activities. The findings of this reconnaissance were then compared with general BCP guidelines and existing data available from the base civil engineer. This was followed by a more detailed survey of land use and the development of land use planning criteria, which resulted in the identification of specific and general land use planning opportunities and deficiencies at the base.

The principal factors affecting proper land use planning at Hometown are discussed below. The discussion is supported by illustrations which provide more detailed guidance in evaluating land use. Section 4.0 presents the results of the detailed land use survey referred to previously.

A generic description of each land use category that occurs at Hometown AFB could appear here. Functional relationships among these uses would be analyzed, as illustrated by Figure B-1. The planning process, including who was involved, would also be described.

## **2.0 LAND USE PLAN GOALS AND OBJECTIVES**

The goals and objectives that guided development of Hometown AFB's land use plan are enumerated below.

- o Promote the most functional and efficient land use pattern.
  - Promote the ongoing development of functionally related land use complexes or nodes by consolidating presently scattered, compatible activities in larger, more efficient structures.
  - Ensure ability to perform the base's mission by constraining rapidly increasing demands for runway usage and apron front age.
  - Eliminate existing land use incompatibilities such as the proximity of industrial uses to family housing in several areas of the base.
  
- o Plan for future growth and change



- Control increasing demands for future on-base space from competing agencies in order to limit constraints on mission effectiveness.
- Free land for future expansion by consolidating functionally related activities in more efficient complexes.
- o Promote compatible and coordinated land use decisions and policies by federal, state, county, and local agencies.
  - Establish a regular mechanism for review of major Air Force and civilian development proposals that could significantly affect the base or adjacent lands.
  - Rapid growth in the immediate vicinity of the base and its potential impact on the base's mission must be taken into account.
  - Ensure that the AICUZ is adhered to in order to prevent future impacts on mission effectiveness.
- o Enhance the base's visual and aesthetic image.
- o Maximize the well-being and quality of life of on-base personnel and residents of adjacent, off-base areas.

Goals and objectives would be consistent with those set forth for the entire comprehensive plan.

### **3.0 REGIONAL PROFILE**

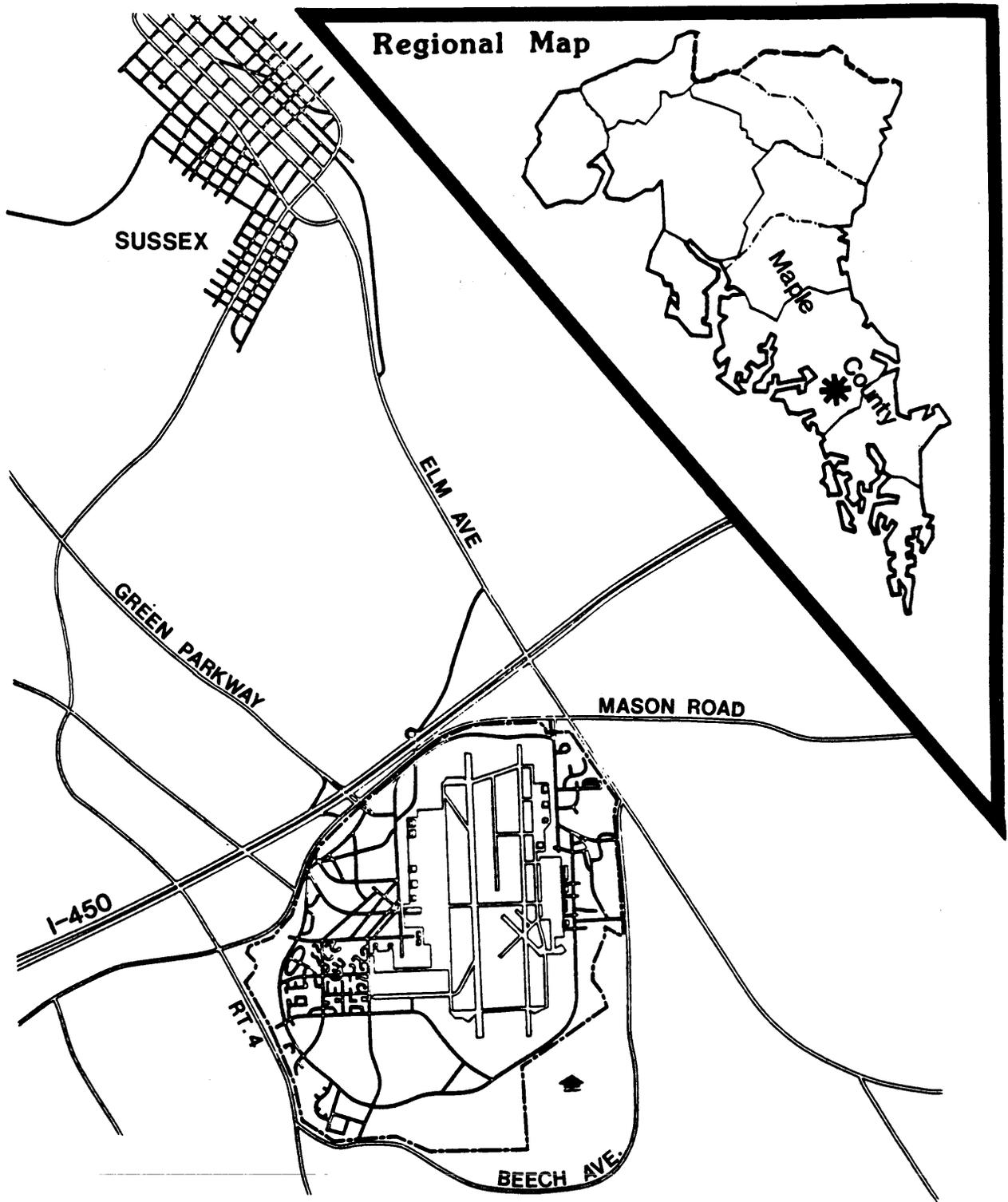
Hometown AFB is located almost in the center of Maple County. It is ten miles southeast of the city of Sussex, and is located just

outside Interstate 450, which encircles Sussex. Just inside the Interstate to the north and northwest of the base are a number of residential communities with a variety of low- and medium-density housing. Lower-density residential areas and a U.S. Navy radio receiving station are located east and south of the base. The Green Parkway and State Route 4 intersect near the northeast corner of the base and lead to downtown Sussex in one direction and to U.S. Highway 801 in the other (Figure B-2).

Maple County was one of the nation's largest and fastest-growing counties during the last decade and is still growing today. It typically costs less to live in Maple County than in other close-in suburbs of Sussex, a major factor encouraging growth. The growth of Hometown AFB has also contributed to county growth: the base now hosts more than 19,000 active duty military personnel, dependents, and civilian employees. This has had a positive impact on the economy of the county and the entire region, but has also placed many demands on county services.

Considerable potential for major conflicts between flight operations and county growth exists. To ensure the long-range viability of the base and minimize these conflicts, a comprehensive study of aircraft noise and accident potential zones was conducted in the early 1970s and publicly released in December, 1974. This study establishes an Air Installation Compatible Use Zone (AICUZ) for Hometown that county planners have used to try to control development near the base. The base's two parallel runways run directly north and south. As a result, the Hometown AICUZ extends directly north to the vicinity of the U.S. Highway 100-Sussex Interstate interchange; it extends directly south almost to the intersection of State Route 4 and U.S. Highway 801. When the AICUZ study was released, there were already many existing land uses that conflicted with the planning guidelines in the study. Future growth of the county will make it increasingly difficult to fully implement AICUZ objectives, despite significant progress since 1974.

Figure B-2. **Hometown Air Force Base  
Location Map**



Housing costs near Hometown are much higher than at other Air Force bases and school busing is also more extensive. Off-base apartments and rental townhouses typically range in cost from \$330 to \$570 per month for one-bedroom units to \$485 to \$700 per month for three-bedroom units. Sale prices for two-bedroom, single-family homes usually begin at \$60,000 to \$70,000. Many military families, therefore, prefer to live in one of the 2,084 conventional family housing units or 212 mobile homes on base, even though either choice usually entails waiting several months to move on base and thus requires two moves. Others commute long distances to lower-cost housing areas to the south and east of the base. Children living on base attend 11 different elementary schools, three junior high schools, and one senior high school. Only one elementary school is located on base.

## **Regional Analysis**

The growth of Maple County and downtown Sussex will have an even greater impact on Hometown in the next 20 years than it has had in the past. This impact will affect access to the base, aircraft operations, housing, schools, and related issues such as environmental concerns and the overall quality of life.

Highways in the immediate vicinity of the base are generally well- designed and in excellent condition. They provide easy access to the base at most times of the day, but rush-hour congestion is steadily increasing. The commuter train system serving Sussex will eventually extend a line to about four miles from the base, with a possible extension that would come closer to the base. This line is now likely to be among the last parts of the system to be built and will still require a bus connection between Hometown and the station. Even when the system is completed, the vast majority of people commuting to Hometown will continue to have to drive to the base unless bus service is expanded. Congestion on the highways surrounding the base will probably continue to increase even after the system is finished because commuters from outlying areas will not be able to use the system to reach the base. Widening Green Parkway to four lanes near the base will also increase traffic on Elm Avenue leading to the north gate of the base.

Highway congestion already has a direct impact on Hometown AFB. Morning rush-hour traffic on Route 4 is so heavy that many people living south of the base take back roads to enter the base through the Beech Avenue gate at the south end of the base, even if their final destination is nearer to gates at the north end of the base. To cope with this traffic flow, security police must now direct rush-hour traffic at the intersection of Beech Avenue and Perimeter Road. Even though Route 4 and Mason Road are four lanes wide, it takes about 15 minutes longer at rush hour to reach the Main Gate or the west gate from the south via these roads.

Even more important is the longer-range potential for conflicts between county growth and aircraft operations. Master plans and related zoning maps developed by Maple Count have been completely revised since the Hometown AICUZ planning guidelines. This is a major step forward. The importance of Hometown to the county is clearly recognized in these plans. Nevertheless, fully implementing these plans by controlling incompatible development will be a formidable task. County officials mentioned at least one successful effort in this area, where a high-rise hotel proposed near the north end of the base was not built. Similar proposals may have been approved in the past or will be in the future if similar action is not taken.

#### 4.0 EXISTING CONDITIONS

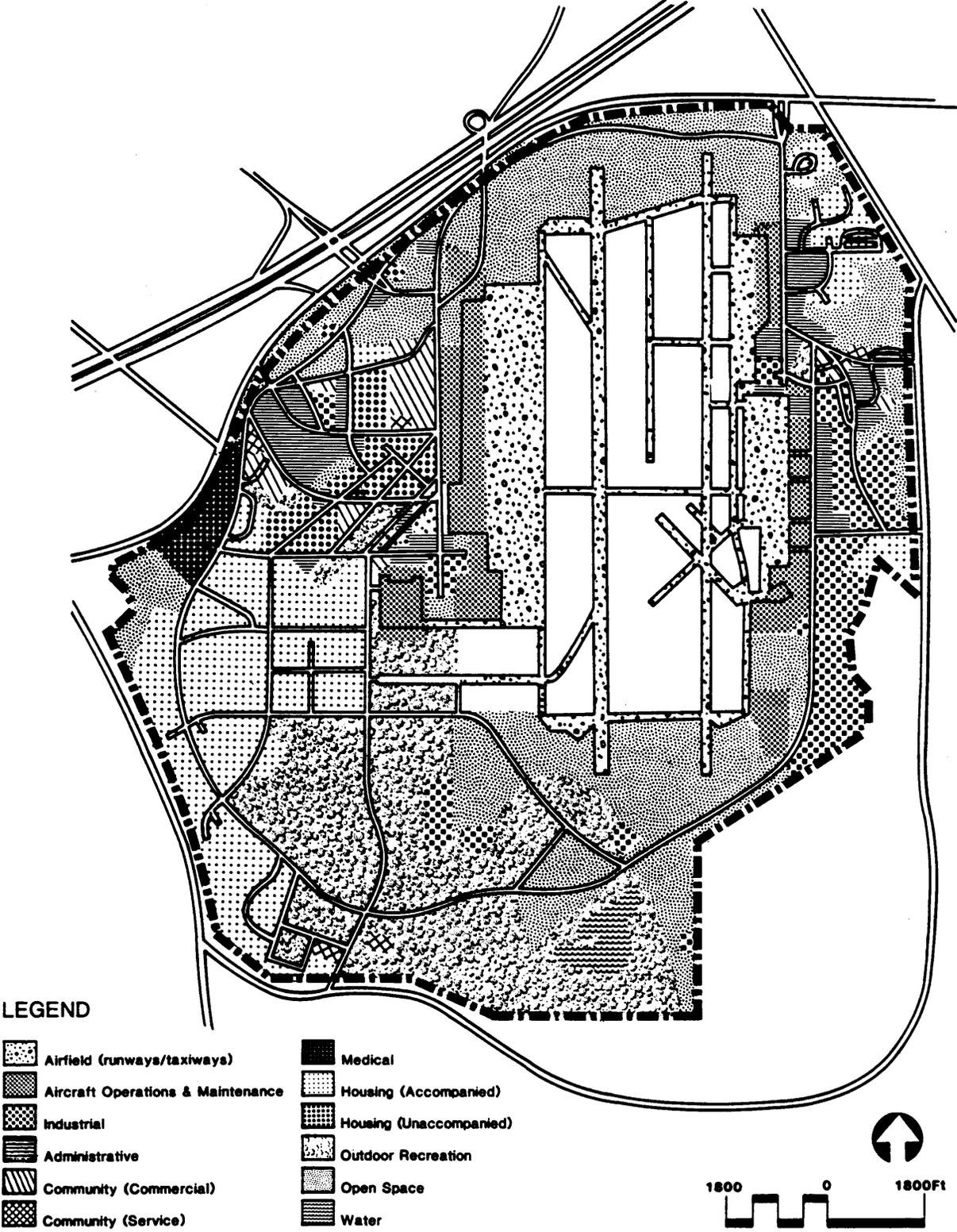
A survey of land use was undertaken at Hometown AFB to determine existing land use conditions and to identify any problems or conflicts. Table B-1 summarizes land area by category. Detailed findings for each category are presented below and existing land use areas are graphically illustrated in Figure B-3.

**Table B-1  
Existing Land Use**

<u>Category</u>		<u>Acres</u>	<u>Percent of Total</u>
Airfield		605	35.6
Aircraft Operations and Maintenance		26	1.5
Industrial		86	5.1
Administrative		133	7.8
Medical		14	.8
Community Commercial		28	1.6
Community Service		11	.6
Housing			
Accompanied	185		
Unaccompanied	49	234	13.8
Recreation		56	3.3
Open Space		383	22.5
Water		<u>125</u>	<u>7.3</u>
		1701	100.0

Detailed findings about each land use would be provided here, including the condition of facilities, their location relative to similar or linked uses, and conflicts with adjacent uses.

**Figure B-3. Hometown Air Force Base Existing Land Use**



## **5.0 CONSTRAINTS AND DEFICIENCIES IN EXISTING LAND USE PLANNING AND DEVELOPMENT AND OPPORTUNITIES FOR THE FUTURE**

On the basis of detailed land use surveys undertaken at Hometown AFB, constraints and deficiencies in existing land use planning and development have been identified and are presented in this section. For each land use zone, development factors which weaken or constrain existing uses, conflict with predominant uses, or generally detract from the quality of the predominant land use in the vicinity are noted and described. Major groupings of constraints are included under a common heading to assist in identifying the needs for base-wide planning initiatives. A constraints/opportunities evaluation is presented to serve as a basis for developing a future land use plan which preserves and strengthens positive land use features, while resolving major land use conflicts.

A similar analysis is made of the positive features existing on base which should be strengthened and preserved. This analysis overlaps with the previous one in that it also identifies areas on base where redevelopment and/or changes in existing land use are warranted. The analysis is necessarily broad in its approach to avoid encumbering future planning with such detailed considerations as current users of a given area, the existing condition of a particular building or facility, or anticipated changes to existing conditions.

A concise discussion of existing conditions and practices would be provided, showing where there are deficiencies, and where changes are constrained or opportunities for change exist.

## **6.0 FUTURE LAND USE PLAN**

Table B-2 summarizes the future land area by category and shows the change from existing conditions. The future land use pattern of Hometown Air Force Base is presented in Figure 3-4. The following section discusses in detail the changes in land use recommended by the plan. This discussion

also presents the specific capital improvements that will be required to implement the plan.

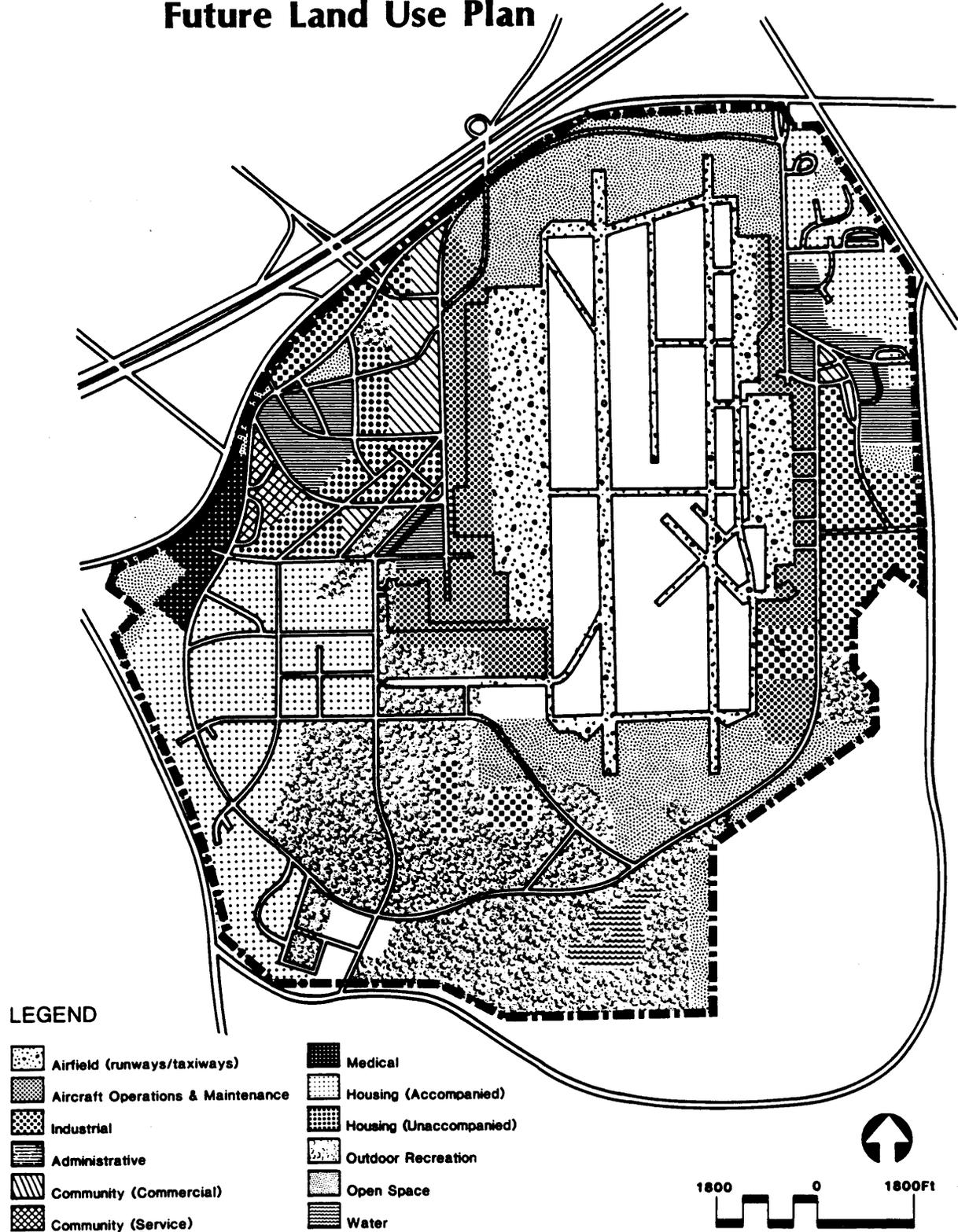
**Table B-2  
Future Land Use**

<u>Category</u>		<u>Acres</u>	<u>Change from Existing</u>	<u>Percent of Total</u>
Airfield		605.0	0.0	35.6
Aircraft Operations and Maintenance		31.0	+ 5.0	1.8
Industrial		87.5	+ 1.5	5.2
Administrative		133.0	0.0	7.8
Medical		15.0	+ 1.0	.9
Community Commercial		32.0	+ 4.0	1.9
Community Service		11.0	0.0	.6
Housing				
Accompanied	182			
Unaccompanied	49	231.0	-3.0	13.6
Recreation		60.0	+ 4.0	3.5
Open Space		370.5	-12.5	21.8
Water		<u>125.0</u>	<u>0.0</u>	<u>7.3</u>
		1701.0	0.0	100.0

### **The West Side of the Base**

One of the main land use objectives for the base is to promote the continued development of land use clusters or nodes comprised of functionally related activities. This is particularly crucial for the western part of the base, which is the focus of a lot of pressure for additional space by various users, and which will require a more efficient land use pattern in order to maintain mission effectiveness.

**Figure B-4. Hometown Air Force Base  
Future Land Use Plan**



## Specific Recommendations

- o Expand the community center to include the block enclosed by Westover Drive, Perimeter Road, "G" Street, and Brookley Avenue. This block is currently undeveloped. Locating community commercial facilities here would create a cohesive, fully developed community center complex extending from "D" Street on the south to Perimeter Road on the north along the west side of Arnold Avenue.
- o Relocate the temporary living facilities (buildings 1801, 1802, 1803, and 1804) into the accompanied housing area located in the south portion of the base. Convert the above four buildings into unaccompanied housing.
- o Relocate the exchange service outlet (building 1568) into the expanded community commercial center noted above. This would free this area up for development as an administrative area, consistent with the adjacent Headquarters Command building which will require additional office space in the future.
- o The administrative area around the Headquarters building located near the main gate should be expanded eastward to allow for future demands for administrative space by the Command. It should be noted that at present an industrial use is located immediately east of the HQ building. It should be phased out and relocated when the opportunity arises. This would remove an existing incompatible use from within developing clusters of administrative, unaccompanied housing, and community center uses. The existing open space in front of the HQ building may be required for additional administrative space. If so, the intent should be to develop a "campus" appearance for this area, given its visibility from the east gate.
- o An additional industrial area is proposed along the south side of Perimeter Road opposite the main gate. However, given the types of nearby land uses, and the proximity of this area to the main gate,

use of this area should be restricted to "light" industrial uses (i.e., those with a minimum of noise, vibration, odor, etc.) which do not require extraordinary security arrangements. There is an existing water pumping and water storage facility in this area. It is assumed to not be feasible or cost effective to relocate these facilities. If this were feasible, it is recommended that this area be designated for administrative use.

- o The area between the west and main gates, and between the base boundary and Perimeter Road, is designated for industrial use. At present this area is occupied by a number of antennas which provide essential communications support. The proximity of these antennas to the base boundary does raise security concerns about ensuring the integrity of these facilities. For aesthetic reasons, and to provide a buffer, this area should be restricted to only those communications/industrial uses that are consistent with the antennas. It should be noted that the antennas, through constraints imposed by their operating frequency, greatly limit the types of development that can occur near them. Finally, the location of outdoor recreation facilities (e.g., picnic areas, tennis and basketball courts, etc.) should be considered for this area as these uses would not be incompatible with the functioning of the antennas.
- o The existing medical area along Perimeter Road in the western part of the base should be retained, and expanded southward across Boston Road into the existing open space area. The existing dental clinic located near the unaccompanied housing and the indoor recreation center should be relocated to this area.
- o The existing administrative area for on-base functions (e.g., accounting, finance, family support, etc.) should be expanded to include the open space located immediately north of the two structures that presently house the administrative services. This is a prime area in which consideration should be given to constructing a single large building capable of housing compatible administrative activities

that are currently scattered throughout the western section of the base. The emergence of an administrative cluster or complex is recommended for this area. This could include linking new and existing buildings with walkways.

- o The above administrative area is currently bisected by an old abandoned runway which runs diagonally through it, and which provides parking for the administrative area. It is recommended that the old runway be removed and new parking be provided for the expanded administrative complex. The north-south street that presently stops at the north edge of this complex should be extended through-it to provide better automobile access to this area. The arts and crafts center located immediately south of the proposed administrative area should be moved into either the administrative area or the nearby recreation complex. This action would eliminate the existing incompatibility of having the arts and crafts center located adjacent to industrial and aircraft operations and maintenance areas.
- o The open space located at the southern extent of the unaccompanied housing area is recommended for future development as additional unaccompanied housing. Given the proximity of nearby outdoor recreational space and the indoor recreational facilities, it is not felt that there would be any adverse effects from the conversion of this area to unaccompanied housing.
- o It is recommended that the aircraft operations and maintenance area at the south end of the west operational apron be extended eastward to the edge of this apron. This is to accommodate a new hangar proposed for this area. This project is permissible because the existing calibration hardstand will be relocated, thus removing the constraint placed on this area by the explosion-quantity arc distance required around hardstands.
- o Two small additional areas for accompanied housing in the south-western section of the base are proposed. The first is the open

pace located east of Perimeter Road and south of the proposed extension of the medical center area (which would contain the relocated dental center). The housing should not extend to the base boundary in order to retain a buffer between the housing and adjacent, off-base land uses. The second area is the open space and picnic area located near the youth center.

- o The community service center area consisting of the elementary school located in the southern part of the base should be extended north to Perimeter Road. This would result in the development of a satellite community center serving the southern area of the base. It would consist of community commercial, community service, and outdoor recreational facilities (i.e., the golf clubhouse). It is recommended that additional community commercial activities such as a shopette or laundry be located in this area.

### **The East Side of the Base**

This section of the base has a much more compact land use pattern due to its smaller land area. Different, and sometimes incompatible, land use types are located next to one another. Competition for space in this area is high because a number of tenant organizations are located here, many of which would like to expand their operations. The challenge of the land use plan in this area is to eliminate existing land use incompatibilities and promote the evolution of a more coherent, logical, and functional land use pattern. Recommendations are presented below:

- o The administrative area encompassing the headquarters building of the largest tenant is proposed for expansion along both sides of Fechet Avenue out to the base boundary. The development of an administrative complex in this area should be strongly encouraged. A campus type of setting should be provided for the major tenant. There are a number of semi-permanent buildings housing administrative activities that are located behind the existing headquarters building of the major tenant. It is strongly recommended that these buildings be

demolished and that the administrative functions performed there be consolidated in a new administrative building for the major tenant.

- o The mobile home housing located south of Pearl Harbor Drive should be relocated, preferably to the area on either side of Fechet Avenue, due east of the extended administrative area. If possible, space for the mobile homes could also be provided adjacent to the accompanied housing area located in the northeast corner of the base. It should be noted that mobile home developments are generally not viewed as being compatible with other forms of accompanied housing.
- o A small segment of open space running along the small stream located south of the proposed administrative and mobile home areas is recommended for use as a buffer between these areas and the industrial area located immediately to the south.
- o The industrial area should be expanded to include the existing mobile home area, and eastward to the base boundary.
- o The site of the old landfill, located at the southern edge of the industrial area, is designated as an outdoor recreational area. It is currently proposed that a new rifle range be constructed here, replacing the one now located in the clear zone in the southern part of the base.
- o The existing aircraft operations and maintenance area should be retained in its present configuration. At the south end of this area across from the old landfill, an industrial designation is recommended. This is to accommodate a proposed new fire training facility, which would be compatible with the adjacent aircraft operations and maintenance activities.
- o The accompanied housing area located in the northeast corner of the base is recommended for expansion. This area should be extended southeasterly along the base boundary toward the small stream which

drains the area located due north of Fechet Avenue. Open space should be retained along the stream to act as a buffer between the housing and the administrative complex located immediately to the south.

- o The development of a satellite community center on the east side of the base is recommended. The area around the existing shopette and swimming pool should be extended southward to accommodate a facility containing such uses as a restaurant, laundry, barber shop, and other conveniences. Relocating the base civil engineer administration office into the new administration area would make the southernmost part of this new community center area available for that use.
  
- o The outdoor recreation and open space area located immediately west of the proposed satellite community center is recommended for use as an administrative area.
  
- o The area south and west of the existing skeet range should be developed for outdoor recreation. This includes the provision of ball fields, tennis courts, etc.
  
- o The area south of Perimeter Road to the base boundary, including the area around Base Lake, should also be kept as an outdoor recreation area. The existing open space between the road and the lake should be used for playing fields, tennis courts, etc. Trails should be developed in the wooded area located southeast of Base Lake.

# APPENDIX C: LONG-RANGE FACILITIES DEVELOPMENT PLAN

The result of the development of the future land use plan is specific recommendations for scheduling and completing capital facilities projects that will be necessary in order to ensure achievement of the desired future land use plan. Once again, boxed segments of this appendix are addressed to the reader.

## HOMETOWN AFB LONG-RANGE FACILITIES DEVELOPMENT PLAN

As a result of the base comprehensive plan, and in particular the land use plan and transportation plan components of the BCP, a long-range facilities development plan has been developed to implement these facilities-related aspects of the land use plan. The implementation strategy of the land use plan will rely on this facilities development plan to implement physical changes over the next five-year period.

Appropriate reference would be made to each recommendation of the land use plan, or each recommendation would be summarized here. A priority would be established among the recommendations in order to establish a development schedule.

Factors affecting the ranking will be:

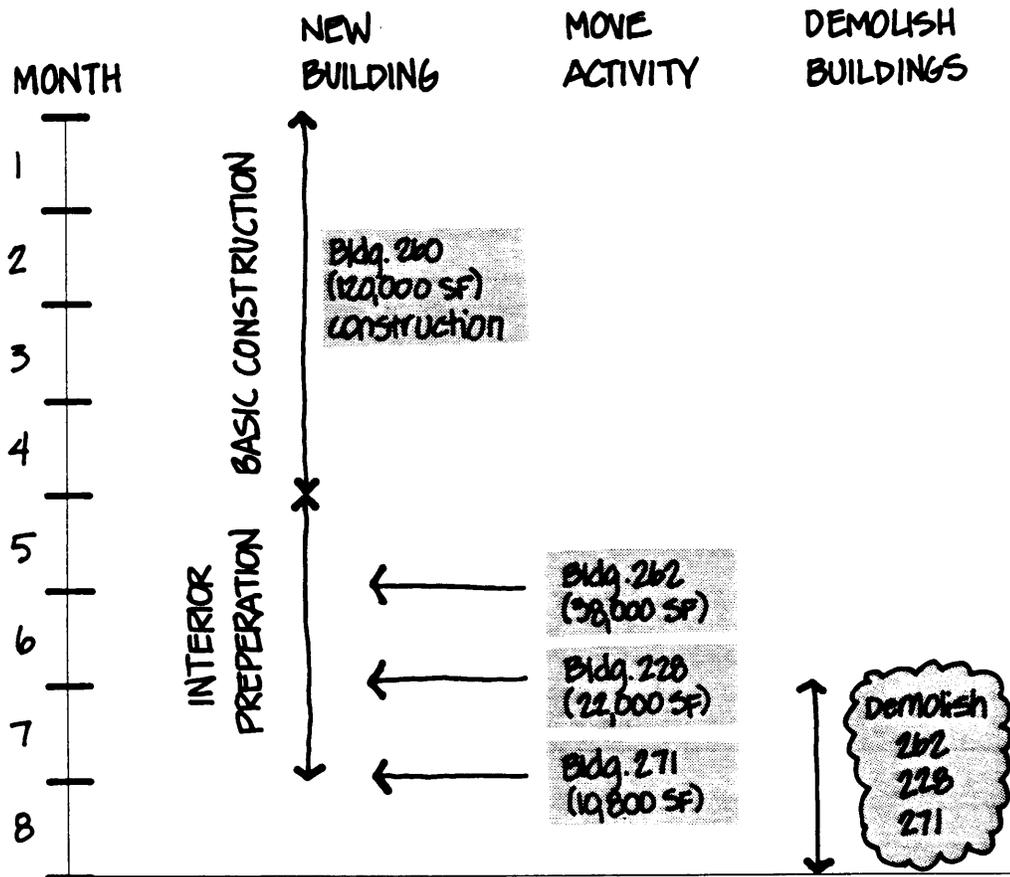
1. Urgency of a deficiency or a hazardous condition.
2. Availability of funds for each category of facility.
3. Logical sequence of demolition, site clearing, construction, and temporary quartering of activities during interim phase of land use plan.

An analysis was made, in consultation with the base civil engineer, base community planner, affected users and tenants, and others, of the interim sequence of events necessary to achieve each recommendation. Critical link-ages were established (where one event has to precede another) to ensure that the interim period until the plan is fully implemented would create as little disruption as feasible. The resulting plan calls for an orderly sequence of permanent and temporary relocations, selected demolitions, and new construction.

For each facility a detailed plan, showing preceding critical and non-critical events and duration of each stage, is provided below.

A capsule plan for each facility's development should be made, and related to a master plan and schedule.

In addition to a priority list, the long-range facilities development plan should have a time schedule for each event so that a facility's improvement or development can be coordinated with all other events in the implementation phase. It would be useful to maintain an annual demolition/construction plan on a C-1 tab in conjunction with the written plan.



**Figure C-1. Project Schedule: Integrated Repair, Overhaul, and Maintenance Facility**

**Table C-1. Hometown AFB Facilities Priority List**

(FY 88-92)

<u>PRIORITY</u>	<u>FY</u>	<u>ITEM</u>	<u>SCOPE</u>	<u>COST (\$000)</u>	<u>PRIOR 5-YEAR PROGRAM</u>	<u>CAT CODE</u>
1	88	Accounting & Finance	43,800 SF	5,050	88	610-249
2	88	Air Freight Terminal	35,900 SF	2,950	89	141-782
3	88	Squadron Operations	9,200 SF	1,650	NEW	141-753
4	88	Energy Security Improvements	LS	2,800	NEW	812-225
5	88	Fire Protection Systems	LS	2,750	NEW	880-221
6	88	Corrosion Control Facility	2,950 SF	850	NEW	211-159
7	89	MWR Support Facility	13,400 SF	850	89	740-672
8	89	Alter Sewer System	LS	1,100	89	832-266
9	89	Airmen Swimming Pool	13,400 SF	1,500	91	750-813
10	89	Fire Station	6,800 SF	1,050	90	730-142
11	89	Add to A/C Engine Shop	8,100 SF	1,050	91	211-157
12	89	Education/Fam Support & Lib	37,000 SF	4,400	91	730-441
13	90	Petroleum Operations Complex	4,500 SF	2,000	91	121-111
14	90	BCE Shop	47,400 SF	5,700	91	219-944
15	90	Non-Destructive Insp Shop	5,500 SF	850	91	211-153
16	90	Consolidated Admin Facility	55,000 SF	7,100	NEW	610-811
17	91	Unaccompanied Enlisted Hous.	500 PN	9,600	91	721-312
18	91	Heat Plant	525 MBTU	49,500	91	821-116
19	91	Medical Center Alterations	410,000 SF	90,000	90	510-001
20	91	Composite Wing/Division HQ	46,000 SF	4,600	NEW	610-249
21	92	Gymnasium	24,000 SF	3,600	89	740-674
22	92	VOQ/VAQ	410 PN	<u>20,100</u>	91	724-417
			TOTAL	219,050		

## **APPENDIX D. MODEL STATEMENT OF WORK FOR A CONTRACTED LAND USE PLAN**

The Land Use Plan component of the Base Comprehensive Plan (BCP) should contain a complete description of current and future conditions on the base. The plan should include graphics suitable to this purpose (see AFR 86-4 for the base' tab (map) series requirements, categories, and symbols).

The Land Use Plan will vary according to the needs and conditions at each Air Force base, but it should contain, at a minimum:

1. Introduction and regional orientation;
2. Statement of goals and objectives;
3. Functional relationships analysis;
4. Description of existing conditions;
5. Identification of problems, constraints, and opportunities;
6. Development and review of plan alternatives;
7. An evaluation of alternatives;
8. A recommended plan;
9. A plan implementation strategy; and
10. Sufficient graphics to enable clear understanding of the findings, process, and results.

These sections of the Land Use Plan should take the reader through an orderly, sequential process of understanding the context for the plan, the approaches used, what was found to exist, alternative plan elements, and the final plan and its implementation.

### **1. Introduction**

The introduction should describe the purpose of the land use plan, the base location and relation to the surrounding region, points of contact on base, a summary of the base needs, and highlights of the recommended plan. A person reading only the introduction should be able to understand the primary elements of the plan.

## **2. Goals and Objectives**

Overall land use goals and objectives should be presented. These guide the Land Use Plan's development and ensure the plan is in concert with the BCP.

## **3. Functional Relationships**

The work involved should begin with an examination of the functional relationships among uses. The identification of functional relationships requires coordination among a broad range of base activities.

## **4. Existing Conditions**

Existing land uses and their condition, location, and relation to each other should be clearly described. The narrative should cover the important aspects of each land use category. Tables should be used to summarize important data and an existing land use and condition map should be prepared.

## **5. Problems, Constraints, and Opportunities**

Describe the current problems, constraints, and opportunities identified during the existing conditions inventory. Include a detailed description of what the problems are and the probable causes. Describe any physical, environmental, legal, and other constraints on planning or development. Also, identify existing facilities or conditions that provide opportunities for improved land use. Include off-base problems and opportunities to the extent that they will affect planning on base.

Prepare a map showing locations of problems and opportunities along with a short narrative of each that is number-keyed to the map. Where feasible, forecast potential future problems resulting from land use or mission changes. Indicate future problems on the same map using a special color or symbol, or by means of an overlay.

## **6. Alternatives**

For each current and future problem/opportunity, describe the feasible alternatives that were considered. Use a tabular format to clearly display alternatives. Prepare sketches of alternatives, particularly changes that are otherwise difficult to visualize. These might include physical alterations such as road realignments, demolition, and construction alternatives.

## **7. Evaluation of Alternatives**

Evaluate the alternatives and describe how this evaluation was done and the results for each problem or opportunity identified. Include a list of criteria and standards used for evaluation purposes. Provide tables showing the comparison of alternatives. Conclude with a ranking of all alternatives.

## **8. Recommended Land Use Plan**

Describe the land uses and their configurations that are needed to meet current and future base requirements. Prepare a map showing the future plan with short-term and long-term recommendations. Use appropriate colors or symbols to differentiate between the short-term and long-term. Include a table describing the recommendations, keying each to the map.

Prepare a table showing estimated total cost to implement the short-term and long-term recommendations. For the short-term (five-year) recommendations, prepare yearly cost estimates which will be considered along with other base needs for inclusion into the Capital Improvement Program.

## **9. Plan Implementation**

Describe steps that should be taken to implement the recommended projects. Include coordination needed among base personnel and off-base agencies. Develop specific policies, programs, and projects that will implement the future land use plan.

To the extent possible, also describe known off-base projects that will influence the base. Provide illustrations or maps to supplement the narrative.

## **10. Graphics**

Graphics and tabular display of data are significant parts of the plan. Maps show geographical relationships that are difficult to describe in text. They are also vital to understanding functional relationships, and the proposed changes from existing conditions to the future planned, conditions.

All contracted work should be clearly outlined prior to execution, and the responsible Air Force personnel should monitor progress and concur in important assumptions and decisions.

# APPENDIX E: PLANNING REPORTS AND DOCUMENTS

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Urban geography is a science of comparatively recent origin that is concerned with the nature and function of towns, with their situations and sites, their relations with each other and with the countryside, their plans and planning problems, and the people who live in them. Its development as a branch of geography has taken place mainly in the post-war period, and although there is already a vast amount of written material on the subject, very few treatises have been produced in recent years. This book provides an up-to-date summary of the main facts and theories of urban geography. It is designed for students of urban geography and for all who are concerned with the problems of cities and who see in them the main element in all regional organization.

Conway, H. M., and Liston, Linda L. 1976. Industrial Facilities Planning. Atlanta: Conway Publications, Inc.

This book is a compilation of useful and significant studies in the field of corporate facility planning and location. The material was chosen, excerpted and presented in a fashion designed to serve today's facility planners in handling new projects for the future. This volume includes a comprehensive subject index, as well as an appendix containing a detailed checklist of site location factors.

De Chiara, Joseph, and Koppelman, Lee. 1969. Planning Design Criteria (Second Edition). New York: Van Nostrand Reinhold Co.

Basic reference material provided here presents a variety of data and standards related to land planning and site design. Topics include master planning and land use principles, housing, vehicular circulation, recreation, and industrial development. Illustrated.

Departments of the Army, Navy and Air Force. October 1975. Planning and Design of Outdoor Sports Facilities. Army Th 5-803-10, Navy NAVFAC P-457, Air Force AFR 68=33.

This manual provides a comprehensive reference source for outdoor sports facilities that contains information required for the planning and design of these facilities. Information is

provided for site adaptation in an outline text of planning and design criteria opposite an accompanying page of definitive drawings. ;The scope of this manual covers outdoor sports and games most commonly played for competition and/or recreation by military and civilian personnel.

Detwyler, Thomas R., ed. 1971. Man's Impact on Environment. New York: McGraw Hill Book Company.

Man's Impact on Environment substantiates the wide spectrum of environmental changes wrought by man, focusing on major processes of change, immediate and extended-effects on the environment, and trends in time and space of processes and effects. Taken together these articles provide a meaningful overview of the present quality of man's environment and the causes for this condition.

Gold, Seymour M. 1980. Recreation Planning and Design. New York: McGraw Hill Book Company.

This book describes the process and products of urban recreation planning. The focus is on basic concepts, measures, methodology and the park and recreation plan. The goal of the book is to improve the quality of life and environment by the provision of better parks and more recreational opportunities.

Lochmoeller, Donald C., and others. 1975. Industrial Development Handbook. Washington D.C.: The Urban Land Institute. Community Builders Handbook Series.

The principal purpose of this Handbook is to help communities and developers achieve better planned work centers for the production and distribution of goods. As such, this Handbook is addressed to four groups of readers, all of whom are decision makers who shape the physical form and economic future of the community: the development community, government bodies, industrial management, and the public.

Martin, Thomas, and others. 1978. Adaptive Use. Washington, D.C.: The Urban Land Institute.

This book is intended as a supportive guide to those who would undertake adaptive use--converting a building originally designed for one purpose to a different and contemporary use--projects. It contains an overview of the economics and process involved in such projects, 15 detailed case studies of specific projects, and profiles of many other projects categorized according to the type of structure being adapted.

McKeever, J. Ross. 1970. Business Parks: a Study of Development Practices and Procedures. Washington, D.C.: The Urban Land Institute. ULI Technical Bulletin 65.

This report is a sequel to ULI's bulletins on residential, shopping center, and industrial types of planned unit development. In the planned unit concept, the developer proceeds under a master plan. This plan predetermines the land uses, relationships among the buildings, open spaces and common facilities. The study is based directly on responses received from a questionnaire form of inquiry addressed to ULI members. Indirectly, the study includes pertinent findings from several previously published reference sources. By these means, the study is directed toward practical experiences from known developments.

McKeever, J. Ross, and Griffin, Nathaniel M. 1977. Shopping Center Development Handbook. Washington, D.C.: Urban Land Institute. Community Builders Handbook Series.

Throughout, the discussion in this book focuses on recommended practices and standards of excellence. As shopping centers have developed, several clearly identifiable types have been defined. We now see three major categories: the neighborhood, community, and regional centers. The super-regional center can reasonably be considered a fourth category, although it differs from the regional center only in magnitude. These categories are not precise, and patterns are still evolving. Special markets have stimulated the development of a variety of special kinds of shopping centers that do not quite fit traditional definitions. The most glamorous of these are now being referred to simply as theme centers or specialty centers. The search for the shopping center of strikingly unusual character has also led to the adaptive reuse of existing buildings as shopping centers, adding another facet to the complexities of analysis and description. Each of these types is described in detail. A series of case studies fully addresses current practices in shopping center development. The Shopping Center Development Handbook contributes to the understanding of shopping centers as one of the most important land use elements in community development.

New Jersey County & Municipal Government Study Commission. October 1974. Housing and Suburbs: Fiscal and Social Impact of Multifamily Development. Trenton, New Jersey: State of New Jersey.

This study was undertaken in an effort to identify the dimensions of the impact of housing development on the communities in which it takes place, and to develop proposals and directions through which reasonable municipal interests can be reconciled

with the need for provision of housing and for orderly development of areas in which growth is likely to take place. To do so, the authors looked not only at the revenues and expenditures associated with multifamily housing development, which was the initial thrust of the research, but also at the social and economic characteristics of housing residents, their attitudes and interaction patterns; at local decision making and the underlying legal principles and practices, and the perceptions and attitudes of local political and civic leaders.

Office, Chief of Engineers (HQ USACE). Department of the Army. 1 March 1981. Installation Design Manual. Army TM 5-803-5, Navy NAVFAC P-960, Air Force AFM 88-43.

The objective of the Installation Design Manual is to provide guidance for improving the quality of the visual environment of Army, Navy and Air Force installations. The guidance offered in this manual is for use by Army, Navy and Air Force personnel responsible for installation planning and design as well as design firms, particularly those offering comprehensive architectural planning and engineering services, that are under contract to plan and design military installations or facilities. The Installation Design Manual is a tool to improve the appearance and functioning of military installations by enhancing natural site assets; compatibly relating the natural and built environments; establishing an orderly organization of activities, circulation and open space system; achieving a consistent architectural character; and coordinating site components such as lighting, signing and street furniture to reduce clutter. This manual includes information gathered from a variety of sources and is intended to serve as a comprehensive reference of design guidance for military installations.

O'Mara, W. Paul., and others. 1978. Residential Development Handbook. Washington, D.C.: Urban Land Institute. Community Builders Handbook Series.

The Community Builders Handbook first appeared in 1947. The basic precepts that led to the acceptance of the original Handbook as a standard working manual on development principles and practice are followed in the preparation of the Residential Development Handbook. The text and illustrations reflect trends in residential development together with the current practices of the Residential Council. The primary objective of this Handbook is to describe current practices in residential development: market and feasibility analysis, financial analysis, site selection, site design, marketing, and rehabilitation. A chapter on future trends rounds out the discussion.

Real Estate Research Corporation. 1974. The Costs of Sprawl: Environmental and Economic Costs of Alternative Residential Development Patterns at the Urban Fringe. Washington, D.C.: U.S. Government Printing Office. Prepared for the Council on Environmental Quality; the Office of Policy Development and Research, U.S. Department of Housing and Urban Development; and the Office of Planning and Management, U. S. Environmental Protection Agency.

The report indicates that low-density sprawl development is more costly in terms of environmental effects such as air and water pollution and energy consumption than higher density developments. This study is an analysis of prototype development patterns and not of actual developments, although empirical data were used.

Smart, Eric J., and others. 1981. Recreational Development Handbook. Washington, D.C.: The Urban Land Institute. Community Builders Handbook Series.

This handbook focuses on real estate development that is distinguished by recreational elements that provide income and add value to associated real estate. It is designed to be a how-to guide for those interested in one or more of the many aspects of this type of development. The subject is discussed both in a general sense and by specific development type.

Strandgaard, Torben. 1975. Residential Site Planning Guide. Washington, D.C.: National Association of Home Builders.

This guide is a "primer" to give builders, developers and interested lay people a basic understanding of residential site planning. With current public concern over environmental issues and with increasing community demand for quality control in project development, good site planning must become an integral part of the overall objectives of the builder/developer. As the demand for good neighborhood planning increases, new approaches and better solutions are needed in the design of communities. A better mix of housing types, improved open space planning, more imaginative landscape architecture, properly planned circulation systems, and well-designed community facilities are vital aspects of a good development plan. The arrangement of these elements within the project and the process by which decisions are made are the main topics of this book.

United States Department of the Interior. February 1978. National Urban Recreation Study: Executive Report. Washington, D.C.: U.S. Government Printing Office.

This report summarizes studies of large and small cities, old and new cities, core cities and suburban areas. These studies indicate that the recreation systems in our cities vary widely in quality and yet share certain common characteristics.

Whitaker, Ben, and Browne, Kenneth. 1973. Parks for People. New York: Schocken Books.

This book, the authors of which are English, provides a very different perspective for those concerned with American cities. The three central points of the book are that public parks are basic to the health and welfare of any community; that planning is a complex process influenced by the interaction of related social, cultural, economic, and political factors; and that the aesthetic, artistic aspect of park design has become too important even as the scientific elements of planning have declined. The authors have attempted to translate the forms of more than a century of Anglo-American environmental tradition into the various processes by which much of the parkland in England and the U.S. was created.

Whyte, William H. 1968. The Last Landscape. Garden City. New York: Doubleday and Company. Inc. (Anchor Books)

This book is about the way our metropolitan areas look, and the way they might look. It deals with the political realities of open space and the conflicting demands that are placed on it, the planning of space, how the need for development relates to the need for open space and the pros and cons of cluster development and the landscape and how to improve it.

Williams, Edward A., and Massa, Alison K., in association with Blair, David H., and Schaal, Herbert R. 1983. Siting of Major Facilities: A Practical Approach. New York: McGraw Hill Book Company. Sponsored by EDAW.

This book describes a systematic and comprehensive process for selecting sites for major facilities. From freeways to power plants and military installations, major facilities have rarely met with a smooth passage from concept to construction. Poor siting decisions have far-reaching effects on the natural environment, on individuals and communities, and on the economy. The goal of this book is to improve site-selection decision making. It is more possible today than it was 10 or 15 years ago to cite cases that illustrate the use of systematic siting methods. This book presents examples. Targeted toward industry, government, and the affected or interested public, it provides a thorough understanding of the comprehensive nature and impacts of the process. By presenting one

structured and broadly applicable process, it advances far toward its goal of providing the means for making major Siting decisions more rationally, more quickly, and more economically. It also offers facility information of considerable value to the land use planner.