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Technical Instructions

AREA PLANNING, SITE PLANNING, AND DESIGN

**Headquarters
U.S. Army Corps of Engineers
Engineering Division
Directorate of Military Programs
Washington, DC 20314-1000**

TECHNICAL INSTRUCTIONS

AREA PLANNING, SITE PLANNING, AND DESIGN

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FOREWORD

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FOR THE COMMANDER:



KISUK CHEUNG, P. E.
Chief, Engineering and Construction Division
Director of Military Programs

TECHNICAL INSTRUCTIONS
AREA PLANNING, SITE PLANNING, AND DESIGN

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CHAPTER 1**INTRODUCTION**

1-1. **PURPOSE AND SCOPE.** These Technical Instructions (TI) describe the Area Development Planning (ADP) and Site Planning processes to be used in preparing plans for construction drawings. The instructions are intended to be used by those individuals given the responsibility for site planning which includes site selection, site development, and site design. The planning procedures that occur in developing a project are described in these instructions. The procedures described are sound and provide a logical process to the end result.

a. **Area Development Plan.** The ADP is described as providing facility planning at the small area or sub-area level which falls between master planning for an entire installation (RPMP) and site planning for individual buildings (see figure 1-1). The ADP process includes the phases--Identification, Evaluation and Implementation. Identification includes defining the goals and objectives, verifying the program requirements, developing functional relationships, defining spatial relationships, providing an inventory of the area and accomplishing a site visit. Evaluation includes the development of a site analysis that graphically shows the developmental opportunities and constraints for the area. Alternative conceptual plans are developed for evaluation and a determination of a final area development plan is accomplished. Implementation includes the procedures of the Army military construction program for development and execution.

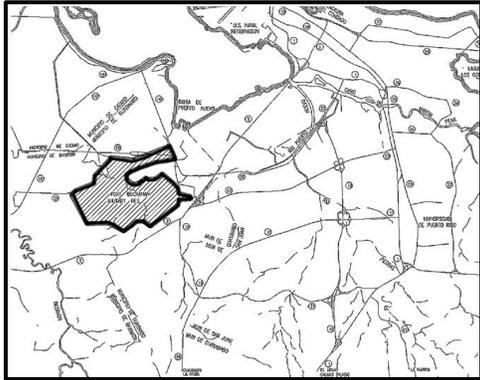
b. **Site Plan.** Site planning is described as further defining the functional layout for specific buildings or functions and their site. It also includes the phases--Identification, Evaluation, and Implementation. Identification includes defining site specific goals and objectives, verifying the program requirements, developing functional relationships, defining spatial relationships, providing an inventory of the area and accomplishing a site visit. Evaluation includes the development of a site analysis that graphically shows the developmental opportunities and constraints for the site. Alternative conceptual plans are developed for evaluation and a determination of a final site plan is accomplished. The resulting site plan provides the basis for the preparation of construction drawings. Implementation includes the procedures of the Army military construction program for development and execution. The design criteria discusses building design, location and orientation, vehicular circulation and parking, pedestrian circulation, surface water management, utility systems design, lighting design, landscape design, and physical security.

1-2. **APPLICABILITY.** These instructions are applicable to all USACE elements involved in preparing plans for areas, sites, and facilities for Army and civilian installations.

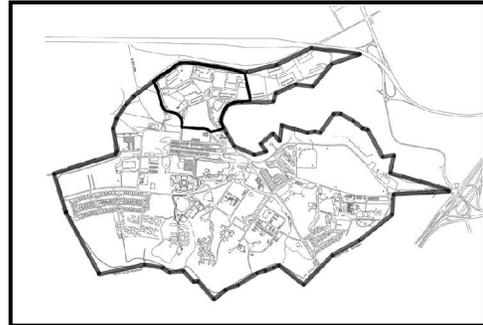
1-3. **REFERENCES.** References used in these instructions are identified in appendix A.

1-4. **DESIGN TEAM.** The ADP and site planning processes should be the responsibility of an interdisciplinary team of design professionals (see ER 1110-1-8152, Professional Registration). This multi-professional approach to the planning process helps assure that all aspects of the man-made and natural characteristics of the area being planned are properly and thoroughly considered (see ER 1110-1-12, Engineering and Design Quality Management). Plans are prepared to provide a comprehensive solution to the program requirements addressing environmental assessment of actions, design quality, and economic efficiency.

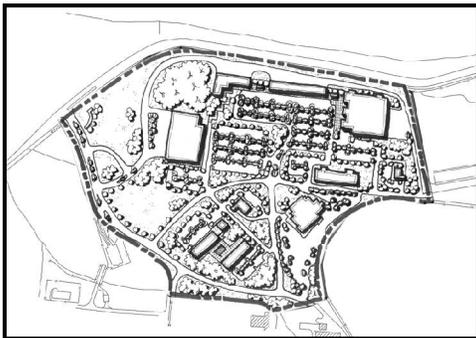
The interdisciplinary team should be identified at the beginning of the planning process so that its expertise can be applied from the outset. The membership of the team and the team leader will be determined by the functional requirements of the project. There are typically four major components of a planning and design team: landscape architecture, land planning, civil engineering, and architecture. The landscape architect may take the lead role because of the expertise required in area and site planning. Other professionals such as mechanical and electrical engineers, hydrologists, geologists, and historic preservationists may be included in the planning process as warranted by specific conditions. Intended users and other citizens should also be involved throughout the process. User input is critical to the success of the plan.



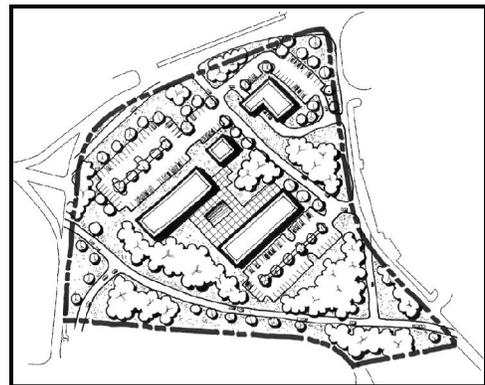
Vicinity scale



Installation scale



Area scale



Site scale

Figure 1-1. Planning Hierarchy

CHAPTER 2

THE AREA DEVELOPMENT PLAN

2-1. GENERAL. This chapter provides guidance for the preparation of an Area Development Plan (ADP). The ADP is a process used to prepare a planning framework for areas that consist of complex or incompatible functions or functions requiring large areas of land which impact circulation and utilities. It may include a number of individual buildings or activities with common elements associated by function such as administration facilities or barracks facilities, or facilities that differ in use but are associated by proximity.

2-2. PURPOSE. The ADP provides for the definition of program requirements by coordinating the location of buildings, vehicular and pedestrian access, parking, open space and other activities or facilities within the area. The end result of the process is a plan for the area both in written and graphic format. It describes the planning process, presents an efficient, economic and functional plan and provides direction for implementing the plan. Graphics are of primary importance throughout the plan to communicate the design intent and planning principles that are proposed for the area. The Final Area Plan is a graphic illustration of all of the elements proposed to occur within the area boundaries. The plan also includes details or sketches to illustrate important land use, circulation, and utilities. The plans, text, and graphics provide a framework that defines an efficient, economic, and functional area. The actual configuration of the individual sites can then be further refined in the Site Planning process described in chapter 3. The area development process uses urban design principles to integrate incompatible land uses and functional requirements within the existing manmade and natural environment.

2-3. THE AREA DEVELOPMENT PLAN PROCESS. The ADP process is designed to occur in a series of steps or actions that result in a Final Area Development Plan. The process is illustrated by the flow chart in figure 2-1. The process involves standard land use planning practices in three major planning phases: Identification, Evaluation, and Implementation. The process is sequential and designed to be followed from beginning to end. Area boundaries and general decisions as to how and by whom the area will be used should have been defined in the Real Property Master Plan. If not, the selection of area boundaries will be determined before the ADP process can begin. For this document, an Area Development Plan for a Community Center will be developed to illustrate the sequence of steps included in the process.

a. Identification. The identification phase includes the setting of goals and objectives, defining facility and spatial requirements, defining functional relationships, and the collection of base maps and data.

(1) Goals and Objectives. The first step in the area development plan process is to define project goals and objectives and installation development goals. Goals and objectives for the project are derived from the user mission. The user mission should be reviewed carefully to determine how the proposed project is intended to accomplish or support the mission.

(a) The user's specific needs will be determined for the following:

- 1/ Functional requirements
- 2/ Creation of organizational efficiency and safety
- 3/ Relationship to adjacent functions
- 4/ Contribution to the quality of life of the occupants

(b) The project goals and objectives become guidelines for the planning process. Goals are general, while objectives define specific actions to achieve the goals. The following goals and objectives are representative of what might be developed for an Installation Community Center ADP. They are based upon the installation goals as stated in the Real Property Master Plan:

1/ Goal: Plan an Installation Community Center that maximizes functional relationships between uses and the interior and exterior spaces.

a/ Objective 1: Locate buildings and parking to provide for ease of access and minimal walking distances.

b/ Objective 2: Provide for centrally located exterior space, away from traffic, that will serve as a meeting area for informal gatherings and lunch-time activity.

c/ Objective 3: Provide for pedestrian access, protected from the weather, that links the various buildings, exterior spaces and parking.

2/ Goal: Provide for direct, safe and easy vehicular and pedestrian access to the Installation Community Center.

a/ Objective 1: Provide most direct access from the Main Gate and from all parts of the installation via collector streets.

b/ Objective 2: Minimize conflicts of vehicular traffic and pedestrian access in parking lots.

c/ Objective 3: Provide for separation of customer traffic and delivery traffic.

(2) Facility and Land Area Requirements. Once the goals and objectives have been adopted, the development requirements and the spatial needs of these requirements can be identified. Accurate project requirements are fundamental to organizing and locating project elements on site. Failure to anticipate true programmatic and spatial needs can create incompatible land use and inefficient spatial arrangements, especially on small or confined sites. The land area or spatial requirements are determined by the size of the various facilities and other activities to be included within the area to serve the facilities such as driveways, walkways, parking and open space. Functional requirements are based upon the number of

employees to be housed within the facility. As an example, The following list defines the activities to be included in the Community Center ADP.

- (a) Commissary.
- (b) Guest housing.
- (c) Credit union.
- (d) Bank.
- (e) Convenient parking for new facilities.
- (f) Safe, convenient vehicular circulation.
- (g) Open space for separation of activities.
- (h) Open space for future development.
- (i) Safe, convenient, direct access for service vehicles.
- (j) Separate pedestrian and vehicular circulation.
- (k) Protect environmentally sensitive areas.

(3) Functional Relationships. The functional relationships of the proposed facilities must be defined so that they can be organized within the plan. This process consists of analyzing the interactions between facilities and activities to determine whether a given pair need to be linked or separated in order to function properly and be compatible.

(a) Functional Relationship Diagrams. The desired functional relationships are defined graphically through the use of Functional Relationships Diagrams. These diagrams organize facilities into ideal arrangements, based upon their interdependence. The diagram delineates the best locations for facilities in relation to each other, irrespective of site considerations. These diagrams can be developed as matrices or as "bubble diagrams". The two types of functional relationships diagrams are illustrated in figures 2-2 and 2-3 and further defined as follows:

1/ Bubble Diagrams are drawn to scale to define the size of the various activities as well as their interrelationships. In a bubble diagram, each bubble is connected with lines which illustrate the importance of the relationship to each other and whether connection or separation is appropriate. The bubble diagram approach is recommended because it provides a visual analysis of the desired relationships. The result of the bubble diagrams is a spatial relationship of the functional requirements. This relationship determines if the program requirements fit on the selected site. A bubble diagram may be developed through the following steps:

- a/ Delineate the approximate size of the primary facility in a bubble or block.

- b/ Delineate the approximate size of support facilities into bubbles or blocks.
- c/ Arrange the bubbles or blocks of primary and support facilities for optimal support.
- d/ Delineate necessary connection and separation between facilities using weighted lines.
- e/ Delineate major vehicular access and circulation with weighted lines with arrows to indicate access points and direction of traffic flow.
- f/ Delineate major pedestrian access and circulation using weighted lines and arrows.
- g/ Delineate future facilities and circulation using dashed lines.
- 2/ A matrix compares facilities or activities numerically or symbolically.

(4) Base Map and Data Collection. The inventory of area data will typically occur simultaneously with the analysis of project requirements and functional relationships. This inventory includes the collection of base maps and data about the environmental and manmade characteristics of the area and its environs. Existing maps and other data should be used whenever possible to prevent duplication of information. The data to be collected should include the following:

(a) Base Maps. The base maps to be used for preparing ADP maps and plans will typically be prepared at a ratio of 1:2000. These scales may vary depending upon the size of the area or degree of detail being provided. The following will be collected or prepared:

1/ Area Base Map. The Area Base Map provides specific data about the area and will be used as a base sheet upon which subsequent maps will be developed. Information typically provided on an Area Base Map includes existing structures; roadways, driveways, parking and walkways, topography, streams, water bodies, vegetation, fence lines, location of utilities, and other significant information. The map will be drawn to scale and will show a north arrow.

2/ Vicinity Map. The Vicinity Map includes the area development boundary and the surrounding areas. Coverage and detail in this map will vary depending upon the size and complexity of the area. The Vicinity Map includes much of the same information as the Site Base Map, but is prepared at a smaller scale to include more area. It is also drawn to scale and showing a north arrow.

3/ Location Map. The Location Map shows the location of the area development in a regional context. The map should be drawn at a very small scale to show the relationship of the site to the region. Typically, this would include the installation boundaries and major roadways within the installation and outside the installation, and major natural features such as an ocean, river or mountain range.

4/ Other Maps. Aerial photographs, Soil Conservation Service soil surveys, and USGS topographic surveys generally provide important data about the area.

(b) Data Collection. Data to be collected falls into three broad categories corresponding to the three environments in which people live, work, and play: the natural environment, the built environment, and the socio-cultural environment. Data to be collected will vary for each project. Data most often required for the successful development of an Area Development Plan is listed below.

1/ Background data such as the Real Property Master Plan, the Installation Design Guide, installation reports, and user input information.

2/ Environmental features such as topography, hydrology (wetlands, ground water, surface water, drainage ways, etc.) and soils.

3/ Tree surveys, including the location, common and botanical name, size and condition of all trees.

4/ Physical features such as existing buildings, utilities (including current use and capacities), roadways (including current use and capacity), driveways, parking, pedestrian walkways, fences, and easements.

5/ Significant architectural or historical features.

6/ Significant climatic conditions such as wind, sun, and precipitation.

7/ Significant views to be enhanced or obscured.

8/ Proposed modifications or changes that will impact the area.

(5) Site Visit. A site visit is an essential part of data collection. No other task provides as much useful information with which to better understand the overall area impacts. It provides a visual assessment of features such as architectural character, significant views, landscape character, and prominent land features. The site visit provides the opportunity to accomplish the following:

(a) Review and verify existing information. Photography, field sketches, and notation are commonly used methods of recording information.

(b) Evaluate the compatibility of existing on- and off-site conditions.

(c) Discover previously unknown or unrecorded conditions and factors.

(d) Evaluate the design qualities and visual qualities of the site.

b. Evaluation. The evaluation phase of the ADP includes the analysis of the data collected in the Identification phase.

(1) ADP Site Analysis. The area site analysis includes verifying and recording collected data in a series of maps, charts and text that document all existing conditions, both within and outside the area. This information provides a basis for the evaluation of the impacts that the existing conditions will have on-site development. All collected data and analysis results should be well documented. The analysis will be accomplished by overlaying the topographic map with transparencies of soils, hydrology and vegetation maps to define the natural conditions of the site. All manmade elements such as buildings, roadways, and utility lines should be overlaid on the natural conditions. This series of maps define the development potential of the area. During the analysis, it is important to understand the impacts various elements can have on the area. It is also important to know how these elements interrelate and are impacted by one another. The following elements should be evaluated:

(a) Off-Site Conditions. An area development is influenced by factors adjacent to the site. Both existing conditions and future development should be considered. The following elements should be evaluated for potential impacts and especially potential connections with the area development.

1/ Land Use. Surrounding land use should be recorded and the land use category verified (see figure 2-4).

2/ Transportation. All existing and proposed vehicular transportation systems to and around the area should be located and evaluated for their hierarchy and current operating capacity. Primary and secondary roadways should be examined to determine access points, traffic loads and vehicular safety requirements. All parking areas should be recorded. Bus routes and loading zones should be identified (see figure 2-5). A Site Traffic Impact Analysis for the area may be prepared.

3/ Utilities. All primary utilities and utility lines should be located and the size of the lines, capacities of generation, and current and projected utilization identified (see figure 2-6). The utilities include:

a/ Water system with locations of fire hydrants.

b/ Sanitary sewer system.

c/ Storm drainage system and drainage basin with invert elevations.

d/ Electrical, gas, and steam systems.

e/ Telephone system.

f/ Other types of communication systems or specialized utility systems.

4/ Environmental Conditions and Hazards. All areas or conditions of environmental concern near the area should be recorded. AR 200-2 and AR 415-15 provide further guidance on assessing environmental conditions.

a/ Storm drainage patterns indicating watershed boundaries and the direction of flow.

b/ Storm water management areas.

c/ Flood plain.

d/ Wetland areas.

e/ Wildlife habitats (especially for threatened and endangered species).

f/ Buried tanks, Installation Restoration Program (IRP).

g/ Other hazards.

5/ Historic, Cultural and/or Archeological Resources. All structures or sites that have been defined as historically, culturally or archeologically significant in the vicinity of the area should be identified.

6/ Safety Hazards. All requirements and distances necessary for safety such as fire codes, flood control, airfield and helipad clear zones, and explosives safety should be identified.

7/ Physical Security. Coordinate the physical security requirements with the Physical Security Plan of the installation. Existing or potential threat, high risk targets, and current vulnerabilities to deter attack should be determined by consulting the Provost Marshal.

8/ Sources of Air, Noise and Light Pollution. Immediate or point sources of pollution should be identified and their impact upon the site evaluated. Information may be found in the environmental impact assessments for the installation. The need and potential for achieving mitigation should be indicated. Non-point sources of pollution entering or leaving the area development should also be evaluated.

9/ Visual Enclosure. The area's viewshed (area of visual enclosure) extends beyond the area boundaries. The degree to which the surrounding environment contributes to the area's sense of enclosure or openness, may create desirable or undesirable views from the area. There may need to be buffers for the area's own visual condition.

(b) On-Site Conditions. All factors within the area boundary should be recorded. Both existing conditions and future development should be considered. Each factor is analyzed and recorded as part of the Natural Environment Analysis (figure 2-7), the Built Environment Analysis (figure 2-8), or the Socio-cultural Environment Analysis (figure 2-9). The following elements should be examined to evaluate potential impacts and connections within the area development.

1/ Geology. Geological conditions above and below the ground surface should be evaluated for the type of rock and its geologic formation.

2/ Topography. Existing elevations, high points, low points, and slopes should be defined. Slopes are usually described by their percent grade and placed in appropriate ranges (e.g., 0-5%, 5-10%, 10-20%, etc.).

3/ Hydrology. A hydrologic assessment provides information on surface and subsurface water movement. This information can be used to prevent flooding, erosion, and pollution of surface and groundwater and to promote groundwater recharge, habitat development, and recreational use.

a/ Subsurface. Subsurface hydrology concerns the storage and movement of water beneath the soil surface. Groundwater moves through the soil and through aquifers. Because aquifers are potential sources of potable water, federal, state and local agencies may regulate the quantity and quality of water allowed to infiltrate the ground surface. If a site is in a groundwater recharge area, there may be restrictions upon the amount of impermeable surface to be implemented and upon the water quality allowed for infiltration.

b/ Surface. Existing surface water bodies such as rivers, lakes, ponds, streams and springs should be recorded. Drainage patterns, flood plains, impermeable surfaces (pavements and rooftops) and other conditions affecting the movement of surface water should also be recorded. Significant information should be depicted graphically.

4/ Soils. Soils types and locations should be recorded and depicted graphically. The development potential of each type should be defined.

5/ Climate. A complete climatic evaluation of the site should be defined. Climatic conditions affect such planning concerns as building location and orientation, pedestrian circulation, and vegetation. The following information should be obtained and evaluated:

a/ Average monthly temperature range.

b/ Quantity, frequency, and type of precipitation.

c/ Midwinter and midsummer sunrise and sunset orientation and angle.

d/ Prevailing wind direction throughout the year.

6/ Vegetation. The location of all existing trees should be shown graphically. The trees should be located by survey and identified by common and botanical name, size and condition. Identification of local plant associations provide information on the types of tree and understory plant material which thrive in the area and should be used for landscape design applications when the area is developed.

7/ Wildlife Habitat. Natural wildlife habitats within the development area should be identified. Threatened and endangered species habitat requires protection.

8/ Archeological, Cultural and Historic Resources. Structures or sites that have been defined as historically, culturally or archeologically significant should be identified.

Those requiring preservation will have a significant impact on the development potential of the area.

9/ Visual Survey. An evaluation of the visual character of the area. This evaluation is made during the site visit and attempts to capture the feeling or essence of the area. Aspects of the assessment including the following:

a/ General geologic, topographic and vegetative character.

b/ Visual character of the site including view boundaries, good and poor site-specific views and their potential for enhancement or mitigation, and special visual features which define the character of the site or make a strong visual impact. Examples include: water bodies, mature tree specimens, rock outcrops, and sunlight and shadow.

c/ Sensory information such as odor, noise, or open or confined spaces.

d/ Microclimate conditions, such as warm or cold areas.

(2) Opportunities and Constraints. The evaluations made in the area site analysis are recorded on a map that summarizes the opportunities and constraints for development (figure 2-10). The opportunities and constraints evaluation is used to verify the adequacy of the area for the proposed project.

(a) The opportunities and constraints map interprets area features as either opportunities to be explored and enhanced or constraints to be avoided or mitigated. Opportunities and constraints maps should define the following:

1/ Natural features to be preserved for environmental protection.

2/ Natural features to be conserved.

3/ Natural features that affect construction (poor soils, steep slopes, etc.).

4/ Climatic impacts of temperature, solar radiation, wind, and precipitation.

5/ Existing structures or other landmarks to be preserved or enhanced because of historic, architectural, or other significance.

6/ Existing structures or other landmarks that share functional relationships and connections with the future development.

7/ Existing structures or other features that have a negative impact on the area through poor siting, visual intrusion, deteriorated condition, noise, or some other factor.

8/ Vehicular or pedestrian circulation points of conflict and opportunity

9/ All utilities to serve the area or that will impact development.

10/ Required buffers, setbacks, or hazard zones as well as easements and right-of-ways that will restrict use of area.

11/ Important visual nodes such as points of entry or major intersections.

12/ Desirable visual impact to be enhanced and undesirable impacts to be screened.

13/ Significant vegetation, especially trees and shrubs.

(b) The opportunities and constraints map provides a graphic guide as to how the area should be developed and where development should and should not occur. Through this approach, information and observations are translated into action.

(c) The opportunities and constraints evaluation is used to verify the adequacy of the area for the proposed project. A key requirement for area verification is the determination that current user requirements obtained from the program analysis can be accommodated within the area defined. If the area is limited or confined so that it will not accommodate the project, the installation will provide a different site or the requirements must be revised.

(d) Limited or Confined Area. When areas do not provide adequate space for the requirements that have been defined, the planner will be required to closely coordinate with the user to determine how the facility can be planned to fit within the confines of the area. Some methods involve reducing the functional requirements, purchasing more land or further simplifying the design. The ADP site analysis should be used to determine the appropriateness of the limited or confined site for the proposed requirements and record that information in the opportunities and constraints analysis.

(3) Alternative Plan Development. The next step in the area development planning process is preparing a plan. Plan preparation begins with the development of alternative plans. Alternative plans are sketch plans that provide organization of the spatial requirements of the ADP. The alternative plans are used to study all possible siting arrangements for achieving an ideal site plan that includes the desired functional relationships and meets the established goals and objectives. Three different alternative plans are generally a minimum required for thorough analysis although more may be required to achieve the optimal configuration.

(a) Alternative plans employ spatial representations of areas drawn to scale to depict the facilities, activity areas, circulation, open space and other desired elements. Each alternative should include notations of potential problems and benefits, without formulating detailed responses to either. As each plan is developed, a record should be kept of the design strategies that were employed as a result of the design decision making process. This information will be used in developing an evaluation matrix for the final assessment of the alternatives. Information can be recorded on each plan or as a separate document.

(b) Alternative plans will include the following information:

- 1/ Delineation of area boundary.
- 2/ Vehicular circulation throughout the area.
- 3/ Delineation of existing and proposed development sites.
- 4/ Site access points, including service access.
- 5/ Pedestrian access and potential linkage.
- 6/ Significant features and proposed landmarks.

(c) The Army provides standard designs for many facilities which may include a site plan to be used where applicable. The standard designs serve as guides only and do not refer to any individual area.

(d) The preparation and evaluation of three alternative plans for the installation community center are provided below as examples of the alternative plan preparation and review procedure process discussed.

1/ Alternative 1 (figure 2-11) includes the following:

a/ Spatial requirements for parking have been provided for all new facilities located within the area.

b/ The guest housing facility has been located near the entrance to the installation to accommodate visitors easily.

c/ The environmentally sensitive area located at the north end of the area has been preserved and used for passive recreation. Pedestrian access is provided from the commercial center to encourage environmental interaction.

d/ Vehicular circulation has been modified. Existing roadways have been preserved wherever feasible. A traffic circle has been developed at the center of the area. This element will serve as a hub around which traffic will flow without having to stop. A landmark or monument is proposed for the center of the traffic circle to serve as a visual focal point. This design facilitates the addition of a fifth roadway to provide access to the bank and guest housing facilities. The entrance roadway has been extended to provide through access to the southeast area of the installation.

e/ Ample open space has been preserved, especially in response to the traffic circle. The proposed open space serves as a visual buffer between elements and to emphasize the central landmark. A large parcel of land at the south end of the area has been preserved for future development.

f/ The credit union facility has been located at the southern end of the area at the intersection of the entrance road and the south connector road. This location will

facilitate ease of use and is convenient to users who do not wish to enter the community center.

g/ The bank facility is located in the northwest corner near the entrance to the installation to provide convenient access from on-base and off-base.

h/ Service vehicles must circulate through the main traffic circle to reach the service entrances of the commercial center site. This may create some traffic congestion through the hub, but results in the preservation of the environmentally sensitive area.

i/ Pedestrian access has been provided throughout the area. In areas of high use, pedestrian access has been separated from vehicular access. Separate pedestrian access has been provided between the commercial center and the bank and between the commercial center and the recreation area as well as within the commercial center.

j/ The commissary facility has been sited adjacent to the PX at the north end of the site in an effort to consolidate the facilities and resources.

2/ Alternative 2 (figure 2-12) includes the following:

a/ Spatial requirements for parking has been provided for all new facilities located within the area.

b/ The guest housing facility has been located near the entrance to the installation to accommodate visitors easily.

c/ The environmentally sensitive area located at the north end of the area has been preserved and used for passive recreation. Pedestrian access is provided from the commercial center and from the guest housing facility to encourage environmental interaction.

d/ Vehicular circulation has been modified. Existing roadways have been preserved wherever feasible. Traffic circles have been created at the two busiest intersections. A landmark has been proposed for the center of each of these intersections. In addition, a north-south connecting roadway has been created to improve access to the commercial center. The entrance roadway has been extended to provide through access to the southeast area of the installation.

e/ Open space has been preserved at the entrance to the installation and along the entrance roadway. These two spaces provide a buffer for the guest housing facility. A large parcel centrally located within the area has been preserved for future development.

f/ The credit union facility has been located at the southeastern corner of the area. This location will facilitate ease of use and is convenient to users who do not wish to enter the community center. The credit union has been located adjacent to the bank facility to consolidate land uses and improve vehicular circulation.

g/ The bank facility is located at the southwest corner of the area. This location will facilitate ease of use and is convenient to users who do not wish to enter the

community center. The credit union has been located adjacent to the bank facility to consolidate land uses and improve vehicular circulation.

h/ Service vehicles must circulate through the two traffic circles to reach the service entrances of the commercial center site. This may create some traffic congestion through the hub. However, because access is directed through the hub, the environmentally sensitive area has been left undisturbed.

i/ Pedestrian access has been provided throughout the area. In areas of high use, pedestrian access has been separated from vehicular access. Separate pedestrian access has been provided between the commercial center and the recreation area as well as within the commercial center and between the guest housing facility and the recreation area.

j/ The commissary facility has been sited adjacent to the PX at the north end of the site in an effort to consolidate the facilities and resources.

3/ Alternative 3 (figure 2-13) combines several aspects of Alternatives 1 and 2 and provides a new solution for one of the site concerns. This plan provides the following:

a/ Spatial requirements for parking have been provided for all new facilities located within the area.

b/ The guest housing facility has been located near the south end of the area. This location will accommodate visitors easily but will reduce vehicular impacts at the entrance to the facility. Access to the rest of the installation is improved with this location.

c/ The majority of the environmentally sensitive area located at the north end of the area has been preserved and used for passive recreation. Some of the edge of the area has been disturbed with the introduction of a service road. Pedestrian access is provided from the commercial center to encourage environmental interaction.

e/ Vehicular circulation has been modified. Existing roadways have been preserved wherever feasible. The east-west roadway has been realigned and the entrance roadway has been extended to provide through access to the southeast area of the installation. Two tertiary roadways have been created to improve access to the commercial center and to the bank and guest housing facility.

f/ A large parcel of land has been preserved at the entrance to the installation for future development. Another future development site has been created to the south of the entrance adjacent to the entrance road.

g/ The credit union facility has been located at the far east end of the area. This location will facilitate ease of access for users within the commercial center.

h/ The bank facility is located in the center of the area. This location provides ease of access with the commercial center, the guest housing facility, and the consolidated club facility.

i/ Service vehicle circulation has been separated from the main circulation roadways. From the entrance, service vehicles are directed to the perimeter where commercial center service access is located. To facilitate this circulation pattern, a portion of the environmentally sensitive area is impacted.

j/ Pedestrian access has been provided throughout the area. In areas of high use, pedestrian access has been separated from vehicular access. Separate pedestrian access has been provided between the commercial center and the recreation area.

k/ The commissary facility has been sited adjacent to the PX at the north end of the site to consolidate the facilities and resources.

(4) Alternative Plan Evaluation. Upon completion of the alternative plan preparation, the alternatives will be evaluated and a preferred plan selected. The evaluation process requires that an evaluation matrix be prepared that lists all of the pros and cons that were defined during preparation of the alternative plans. The evaluation matrix for the installation community center area plan is presented in figure 2-14. The process includes comparison of conflicting project demands such as site constraints, ideal solutions, costs, and future expansion needs. The preferred plan will be the one that best addresses the preservation of the environmental attributes of the site, provides the required functional and spatial relationships, and meets the project goals and objectives outlined at the outset of the ADP process. The preferred plan may be one of the selected alternatives or a composite of the most desirable aspects of several or all of the alternatives.

(a) The plans and their design strategies should be reviewed by the personnel listed below to assess the alternatives and review the preferred plan recommendations. The review should include evaluation of the planning matrix, the assets and liabilities of each alternative plan and the recommended preferred alternative.

1/ Design Team.

2/ Customer.

3/ User.

(b) The review personnel should reach a consensus for selecting the recommended preferred plan or an alternative solution to the preferred plan. If an alternative solution is selected, the review personnel should prepare a definitive analysis of the assets and liabilities of the alternative solution that led to selection over the preferred alternative. The preferred plan must be presented to and approved by the Installation Commander and the Installation Planning Board as the final step in the selection process.

(5) Final Area Development Plan. The final area development plan is prepared from the preferred alternative plan through the following process:

(a) Preliminary ADP. The preliminary plan will be prepared as a sketch plan that includes all of the existing and proposed facilities and other activities that will be located within the land areas defined in the preferred plan. These include, but are not limited to

proposed roadways, buildings, driveways, parking, open space, and future development areas (figure 2-15). The preliminary ADP will be presented to the review personnel for review and comment before the Final Plan is prepared. Once the preliminary plan is approved, the Final Plan will be prepared.

(b) Final ADP. Development of the final plan from the preliminary ADP sketch will include a location plan, a graphic illustration of the proposed development, and a written report defining the process and the various elements of the plan.

1/ Location Plan. The location plan can be included as an inset on the Final Plan sheet or as a separate drawing. The purpose of the location plan is to illustrate the location of the development area in relation to the surrounding activities (figure 2-16). Roadways, driveways, pedestrian walkways, utilities, drainage ways and other impacts outside the area should be included. The location plan should be prepared on a standard sheet, to scale, with a north arrow. It may be prepared in color or in black and white.

2/ Final ADP. The final plan graphic should be drawn on a standard sheet, to scale with a north arrow (figure 2-17). Typically, the following elements are included as a minimum on the Final Plan:

a/ Building envelopes drawn to reflect the required square meters (square footage), general desired configuration and desired orientation. The final footprint will be determined in the final Site Plan.

b/ Building setbacks including roadway, property line, environmental, archeological, and safety setbacks.

c/ Existing and proposed roadways and driveways shown at the desired widths and turning radii. Parking lots to accurately portray the spaces and total number of vehicles to be accommodated.

d/ Existing and proposed pedestrian walkways drawn to scale to illustrate width and location.

e/ Areas for plazas or outdoor displays should be identified through graphic illustration or notation.

f/ Areas with special paving or street furnishings should be identified through graphic illustration or notation.

g/ Major landscape elements, such as existing and proposed trees, shrub massing, displays of flowering plants, and significant trees or areas of trees to be preserved.

h/ Large scale open space elements such as athletic fields and parade grounds.

i/ Service areas including trash dumpster locations with screening by walls, fences and or shrubs and trees.

j/ Areas for future expansion whether planned or potential.

k/ Major utility corridors and routings for gas, water, sewer, storm drain lines, telephone, electric, steam, etc.

3/ The Area Development Plan Report. A report to accompany the final plan should include a brief narrative of the Area Development Plan process to provide an overview of the analysis and results. The entire process should be defined including all of the steps taken in the process from the statement of the goals and objectives through selection of the Preferred Alternative Plan and final plan. The report should include copies of all matrices, tables, plans, and sketches used in the process. The narrative should provide a full explanation of the final plan including the following:

a/ The effect of the plan on the Real Property Master Plan.

b/ Proposed facility projects.

c/ Recommended transportation improvements.

d/ Recommended utilities systems upgrades and infrastructure improvements to meet facilities requirements.

e/ Architectural design recommendations and guidelines.

f/ Landscape design recommendations and guidelines.

g/ Site design recommendations and guidelines.

4/ The Area Development Plan Sketches. The area development plan is an inherently flexible document that can be tailored to specific needs. Once the final plan is complete, a variety of more detailed sketches may be included in the ADP report to focus on particular problems or to illustrate the design thought process. These sketches may include:

a/ Building massing, view enhancement/protection strategies.

b/ Proposed roadway and driveway cross sections used to develop the plan.

c/ Landscape planting design and plant material details.

d/ Other design detailing such as material and color palettes for buildings, pavements, site furnishings, etc.

e/ Signage, lighting or other street furniture recommendations.

c. Implementation. The Area Development Plan process relies on a variety of mechanisms for implementation. The plan is directly linked to AR 415-15 which identifies project development procedures to prioritize projects for funding and execution.

(1) Prepare a Schedule and Phasing Plan. The most expedient approach to developing a schedule for implementation actions is to list each project, beginning with the first, and all the actions required for successful completion. The construction of a new military facility requires that an existing building be demolished before construction can begin. The occupants of the existing building would require relocation either temporarily or permanently, making their move the first necessary action associated with the project. The action list for this set of circumstances might read as follows:

- (a) Move Organization A out of Building X into new or interim headquarters.
- (b) Demolish Building.
- (c) Construct Building Y on former site of Building X.
- (d) Move Organization B from Building Z to Building Y.

(e) Demolish Building Z (or move Organization C into Building Z). The demolition of Building C or the movement of Organization C may then be the beginning of another project cycle.

(2) Determine Funding Priority. All proposed projects, including facilities, parking, circulation and landscape design should be classified by priority and funding according to the three classifications listed below. Projects in the intermediate and independent categories can proceed at the discretion of the Installation Commander and the availability of funds. Interdependent projects must be accomplished in the proper sequence.

(a) Immediate. Projects that are funded and proceeding.

(b) Independent. Projects that may be completed in any order because they are not dependent upon completion of another project to proceed.

(c) Interdependent. Projects that are dependent upon the completion of another project before they can be implemented.

(3) Scheduling. Once all the necessary actions have been identified, dates can be assigned to each action or group of actions. This then becomes the schedule that the installation uses to track the progress of the plan and insure its orderly implementation. Figure 2-18 illustrates a typical phasing plan. The implementation phase includes the preparation of a requirements and management plan and the long range plan.

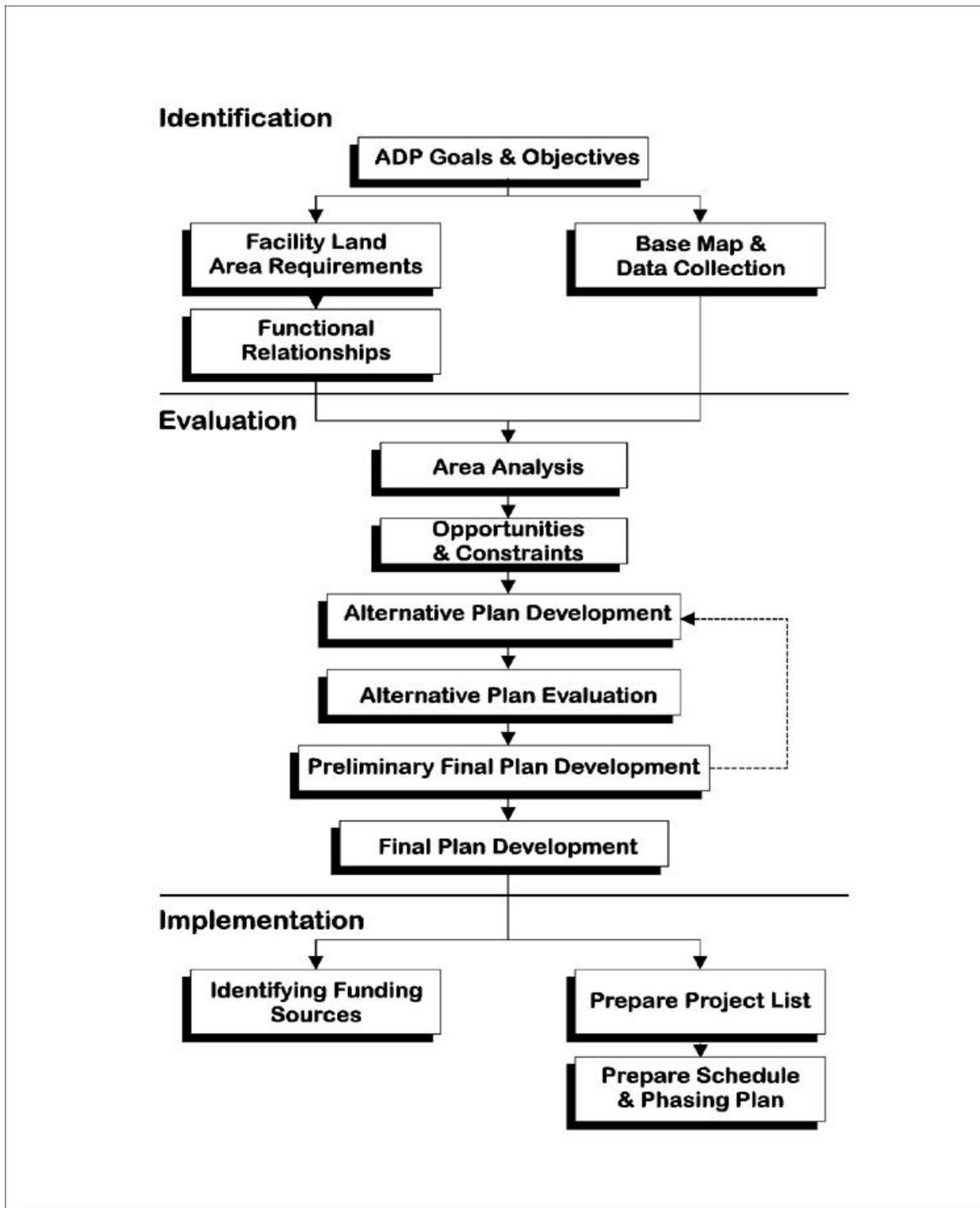


Figure 2-1. The area development plan process

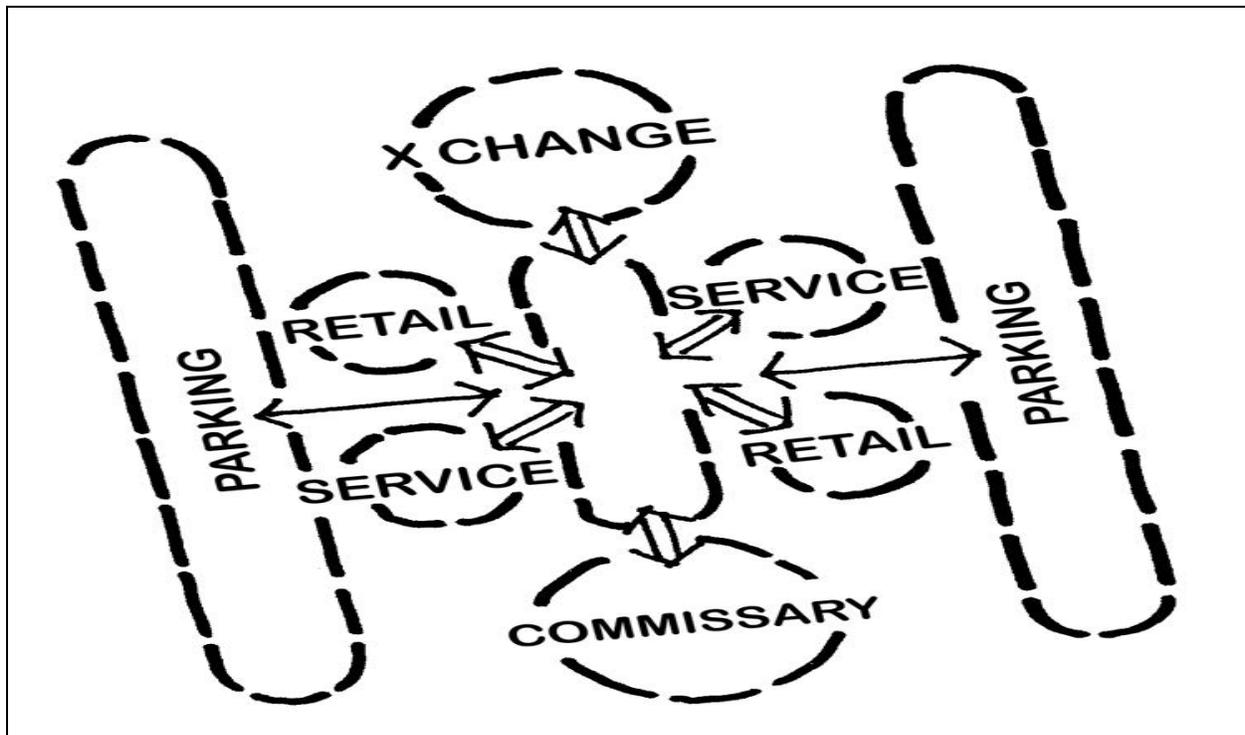


Figure 2-2. Functional relationships bubble diagram

Legend	Commissary	Exchange	Post Office	Indoor Rec. Facilities	Library	Bank Credit Union	Chapel
● Collocation Desired							
◐ Compatible	●	◐	◐	◐	◐	◐	◐
○ Incompatible	○	○	◐	◐	◐	◐	◐
Commissary							
Exchange							
Post Office							
Indoor Rec. Facilities							
Library							
Bank Credit Union							
Chapel							

Figure 2-3. Functional relationships matrix

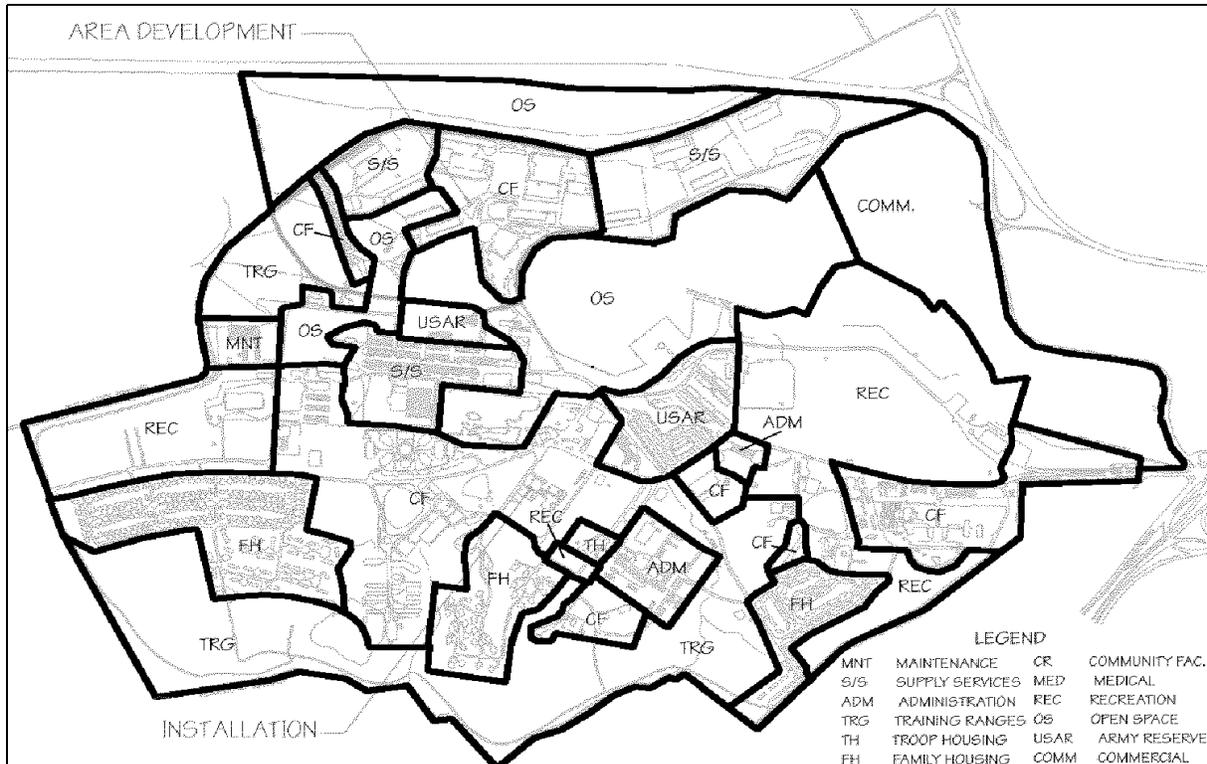


Figure 2-4. Area land use

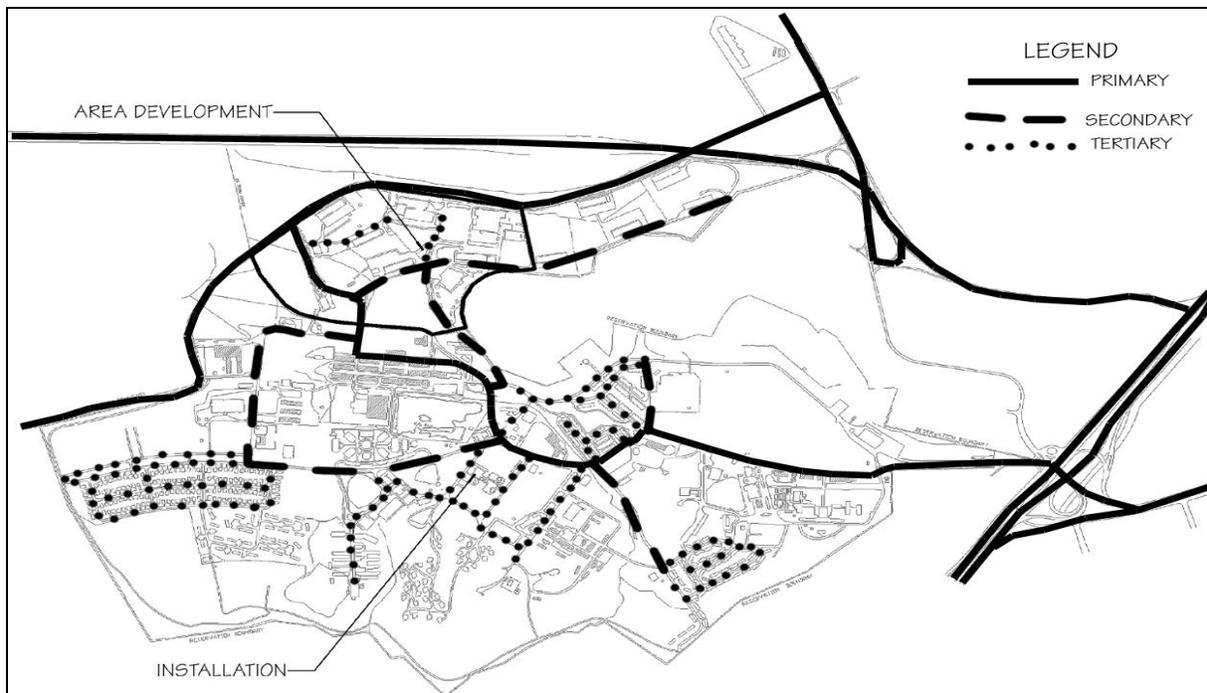


Figure 2-5. Area transportation

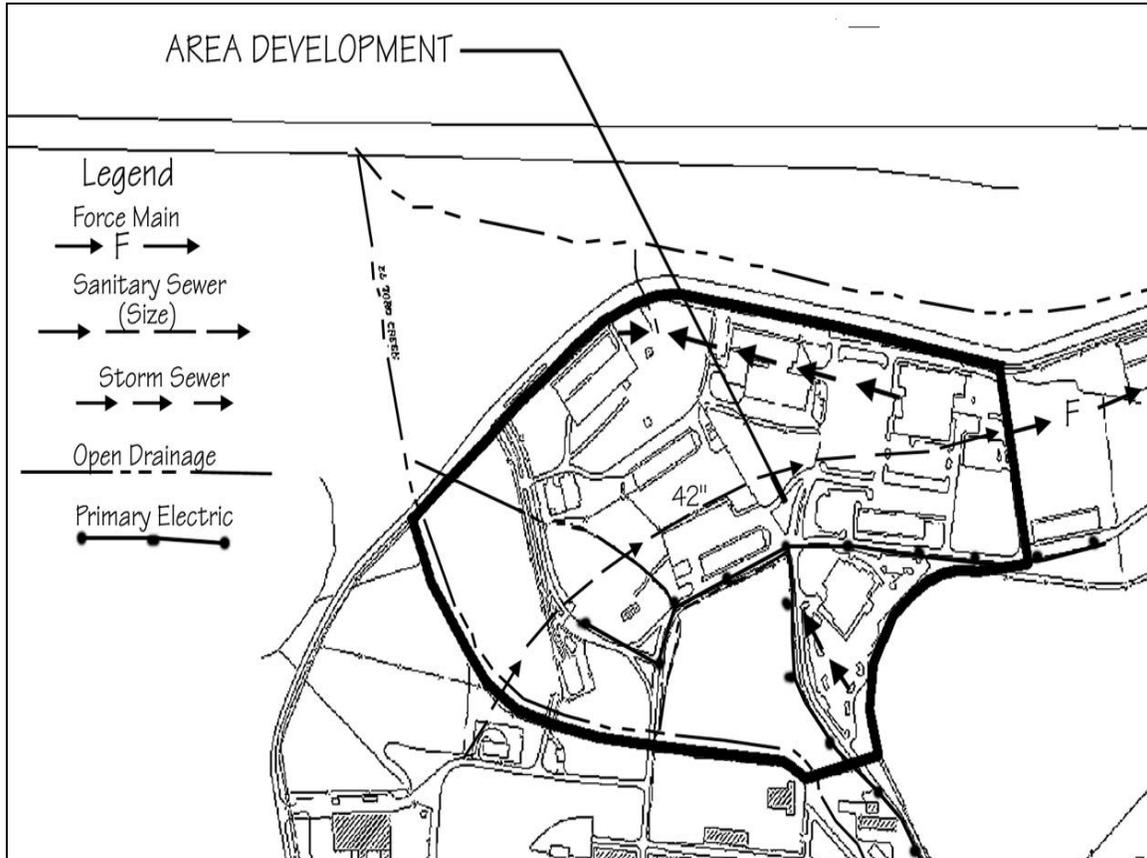


Figure 2-6. Area utility supply lines

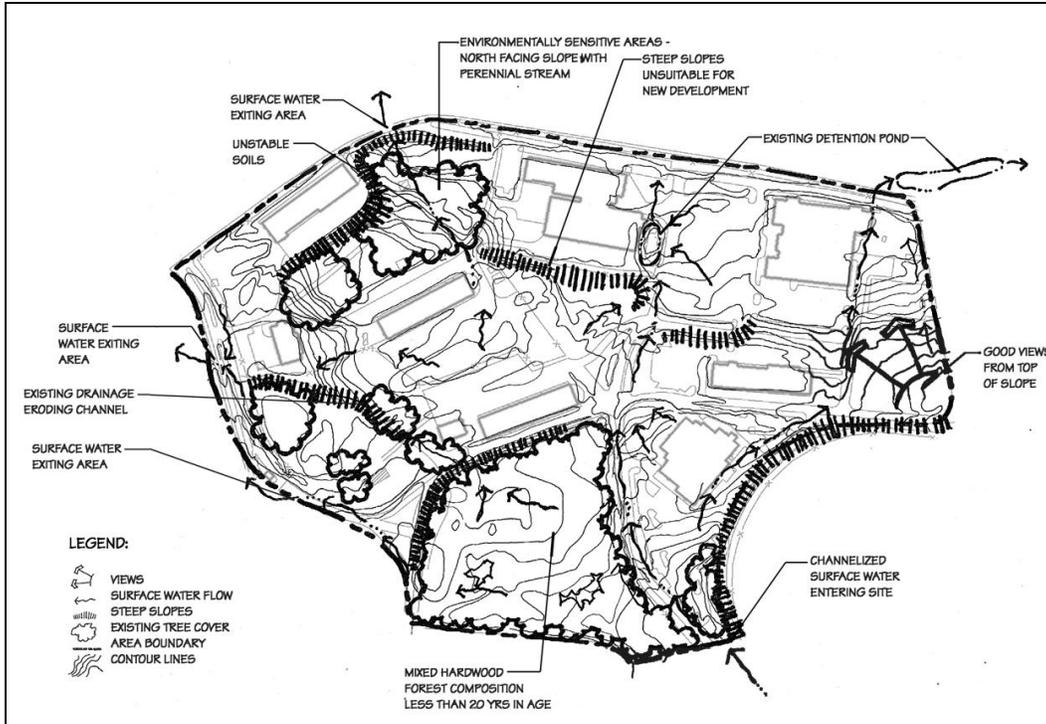


Figure 2-7. Analysis of natural environment

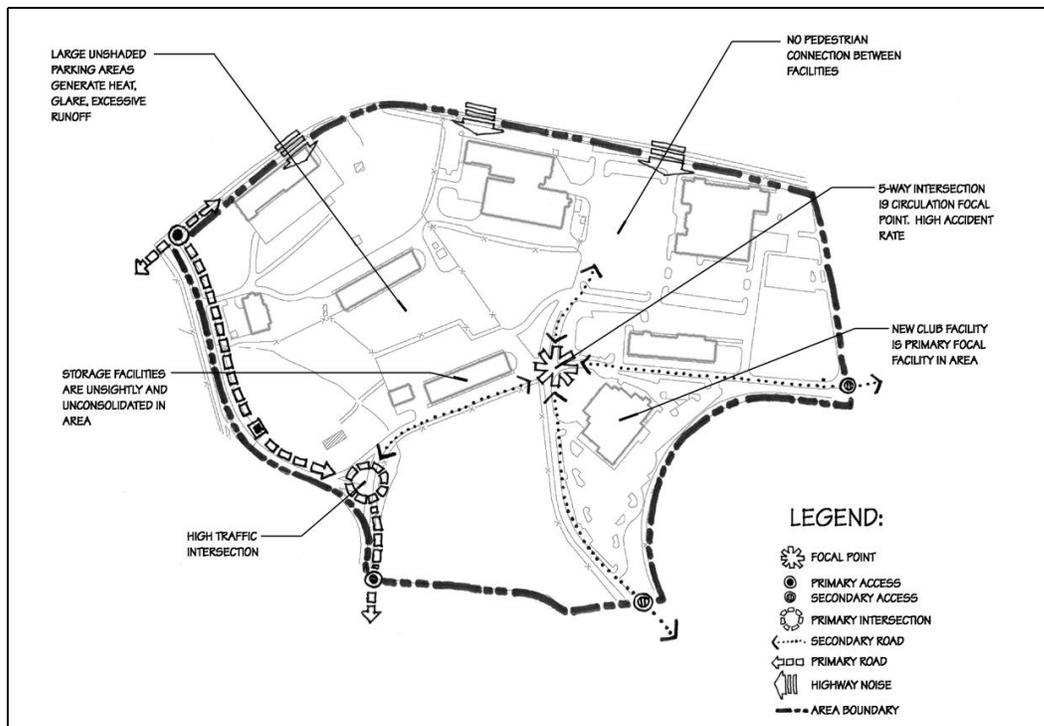


Figure 2-8. Analysis of built environment

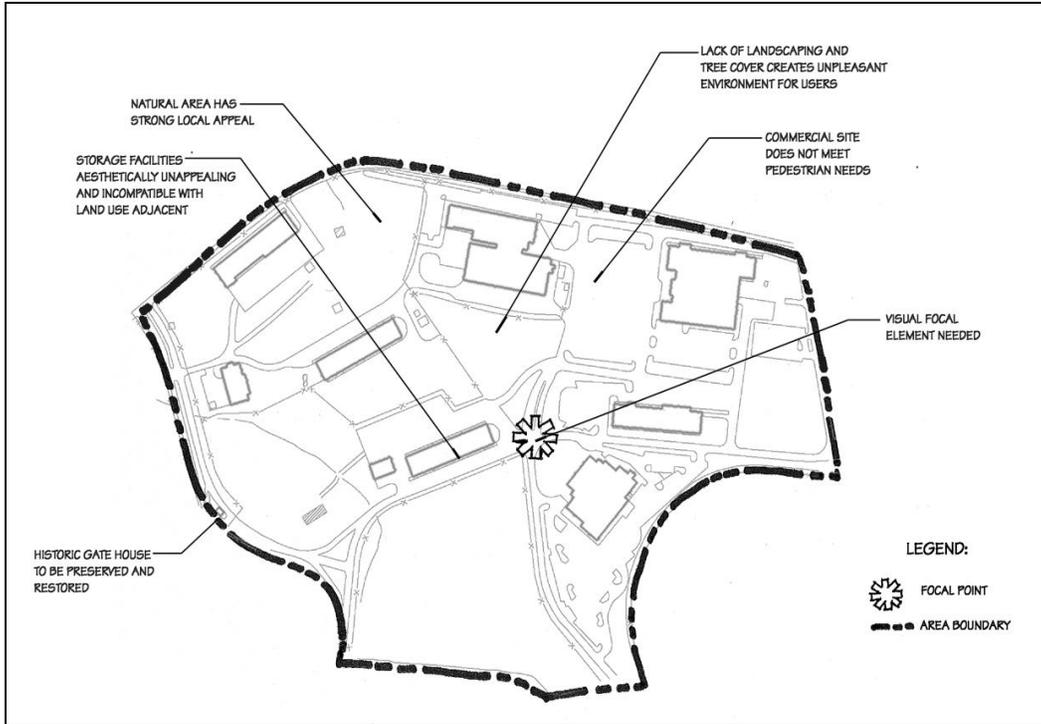


Figure 2-9. Analysis of socio-cultural environment

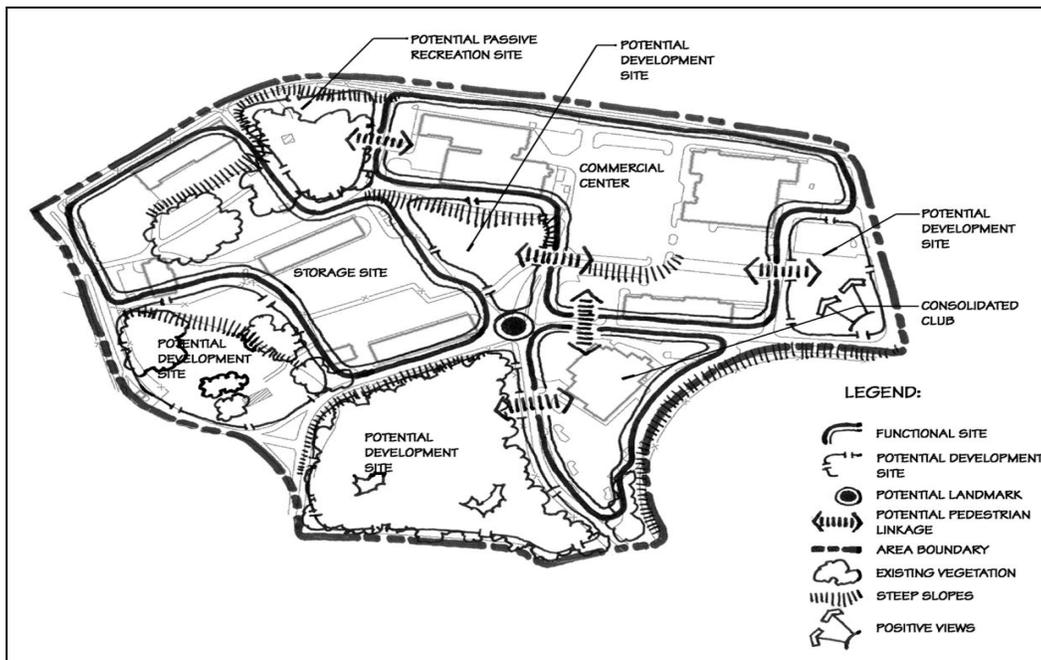


Figure 2-10. Opportunities and constraints

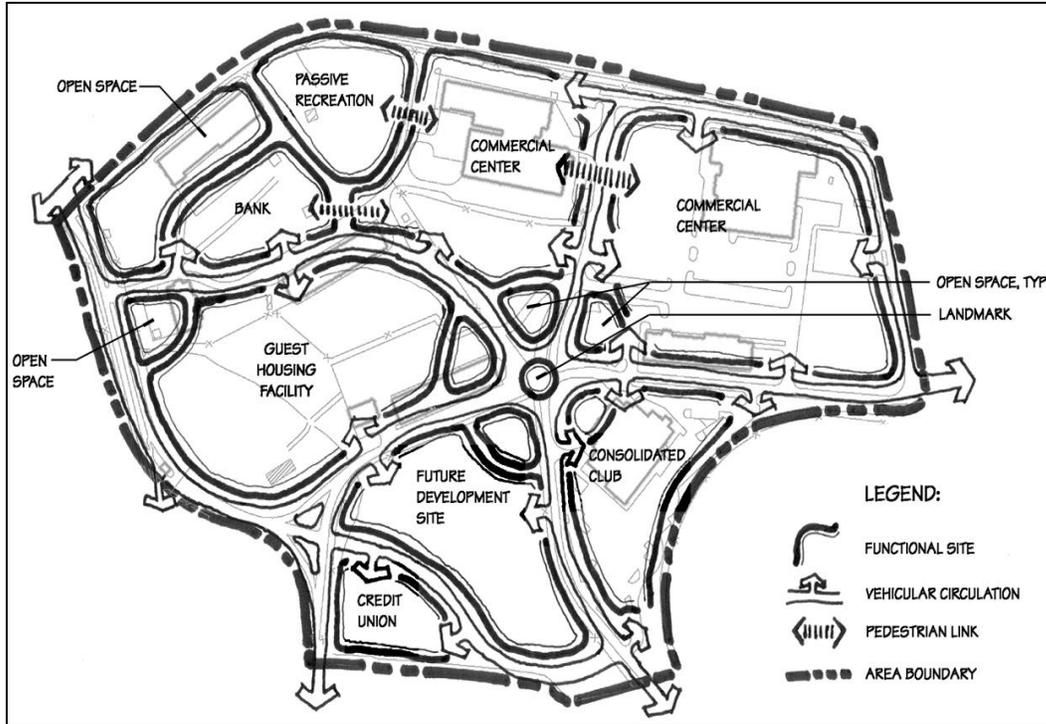


Figure 2-11. Alternative 1 sketch plan

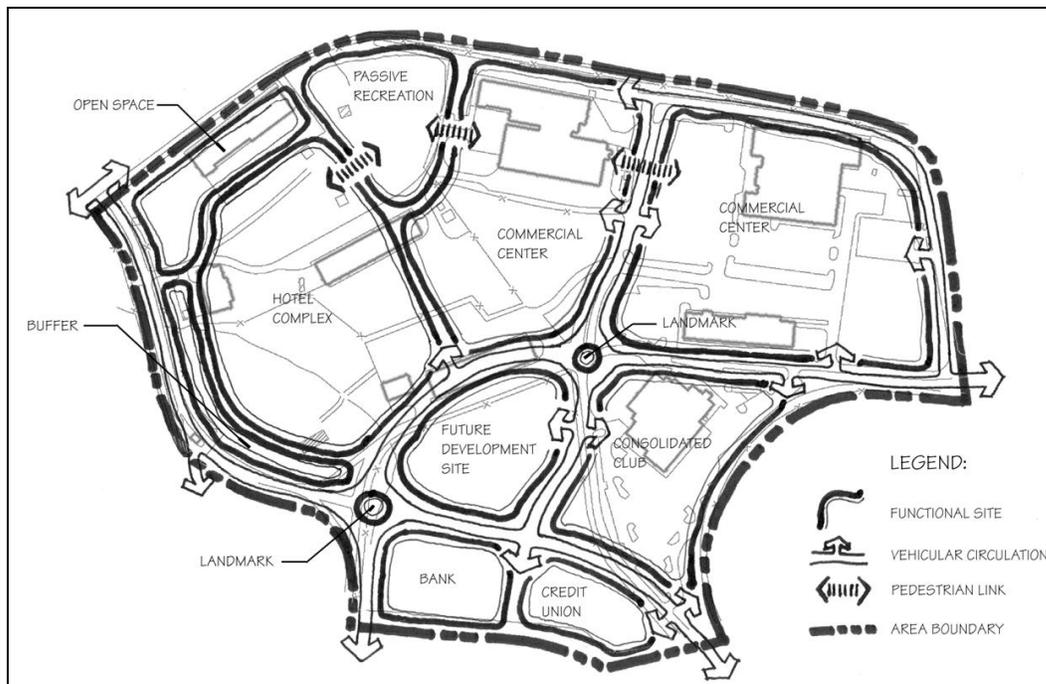


Figure 2-12. Alternative 2 sketch plan

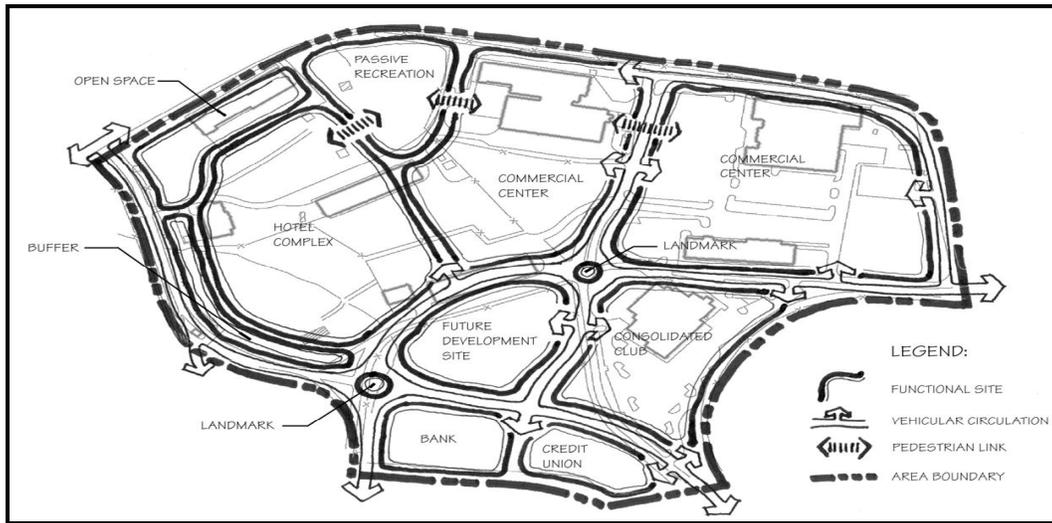


Figure 2-13. Alternative 3 sketch plan

	Alternative 1	Alternative 2	Alternative 3
Provide additional parking for new facilities	2	2	1
Siting of new guest housing facility	2	4	1
Protection of all Environmentally Sensitive Areas	1	1	2
Modify intersection to lower accident frequency	4	1	2
Provide open space for future development	1	1	1
Siting of credit union facility	2	3	1
Siting of bank facility	5	2	1
Provide improved access for service vehicles	4	3	1
Separate pedestrian and vehicular circulation where feasible	1	1	3
Siting of commissary facility	1	1	1
TOTALS	23	19	14
(1=Good, 5=Poor)			

Figure 2-14. Evaluation matrix

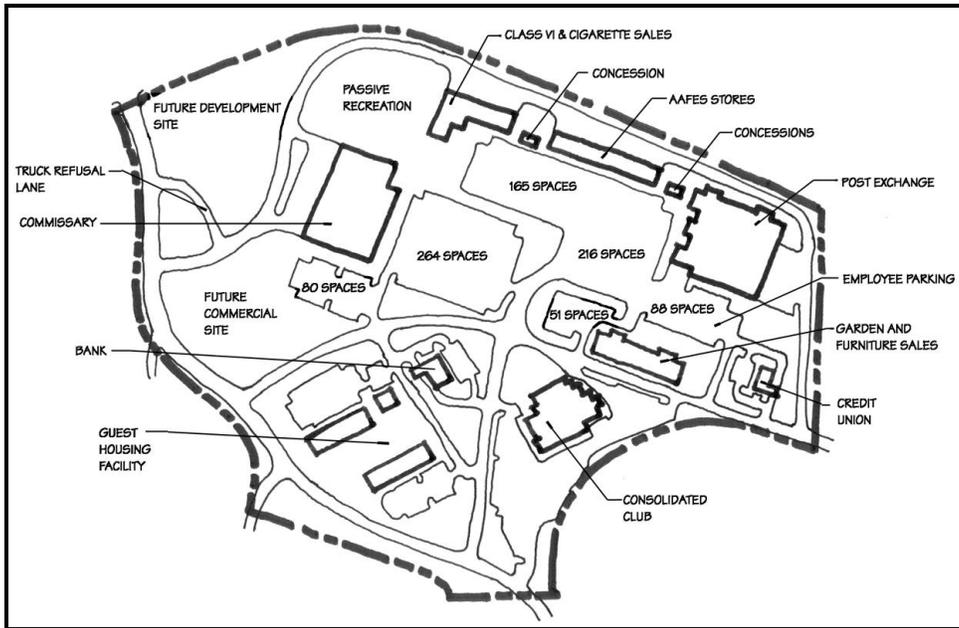


Figure 2-15. Preliminary area development plan

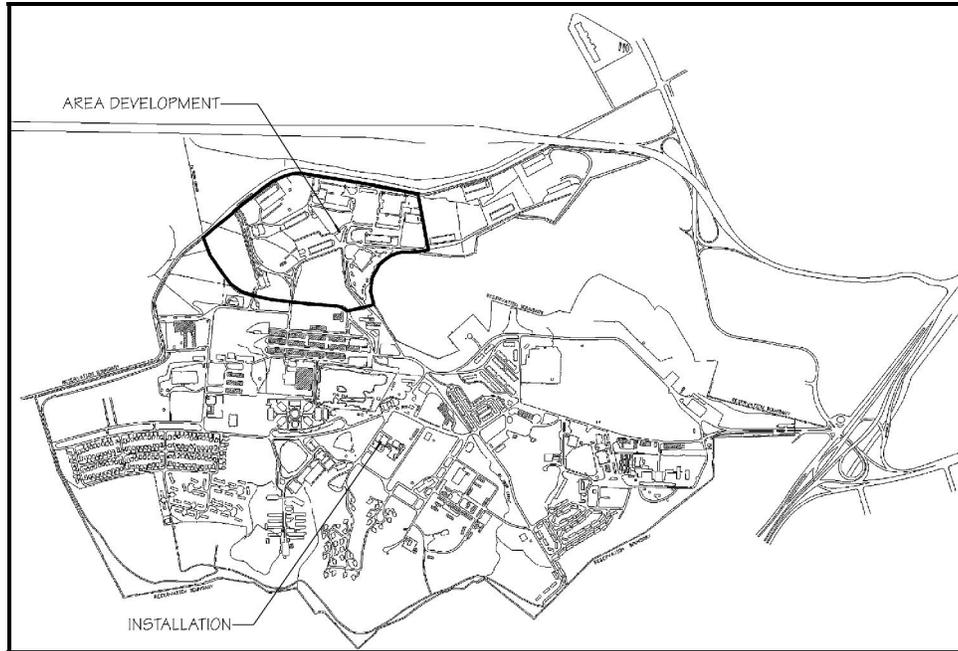


Figure 2-16. Location map

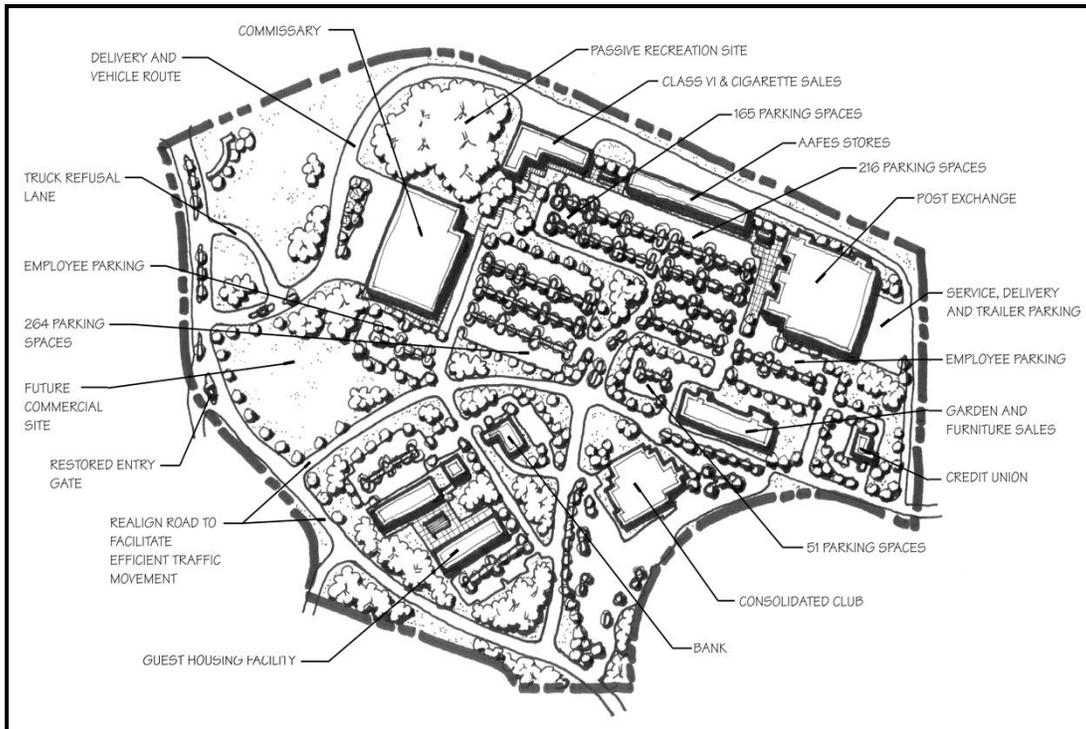


Figure 2-17. Final area development plan

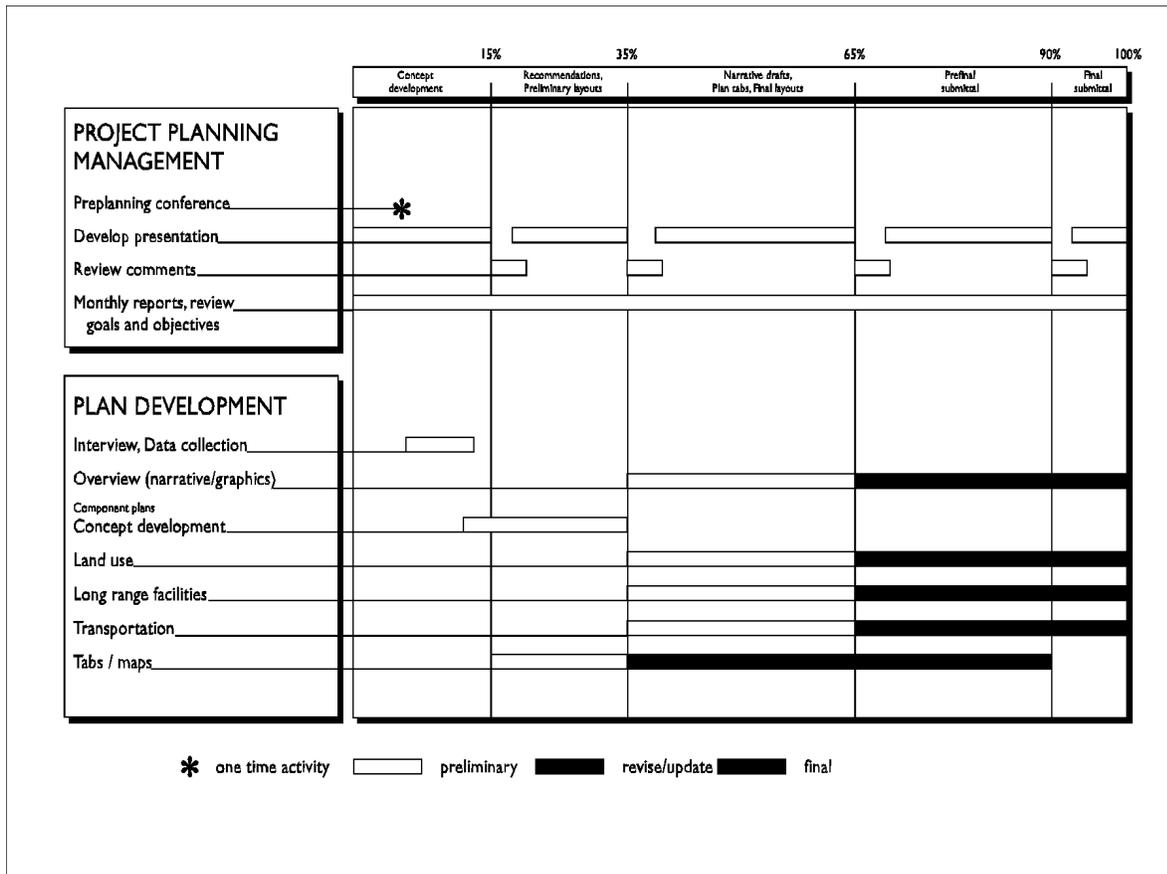


Figure 2-18. Phasing plan