THE SITE PLANNING OF A PLANNED UNIT DEVELOPMENT FOR A SELECTED SITE IN JUNCTION CITY, KANSAS.

by

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INTRODUCTION

This study involves the preparation of a General Development Plan for the planned unit development of a selected site, which is located in Junction City, Kansas.

The purposes of this study would be : 1). to acquaint the people who are not fully familiar with planned unit developments with the concepts and approaches of planned unit developments, 2). to furnish those who are interested in or working on planned unit developments with a general process of land planning, 3). especially to provide the products of this study to Mr. Gerald Ervin, owner of the site selected for planning, for adoption as a guide in his futher development of said site.

The diagram of the study is shown in Figure 1. This study is comprised of three PARTS. PART I is the general study of the planned unit development. Since the site will be developed with the concept of planned unit development, it is, therefore, necessary and required to understand this kind of concept at the very begining of the planning process. PART II is the analysis of the selected site for development, and PART III is the site planning using the planned unit development approach.

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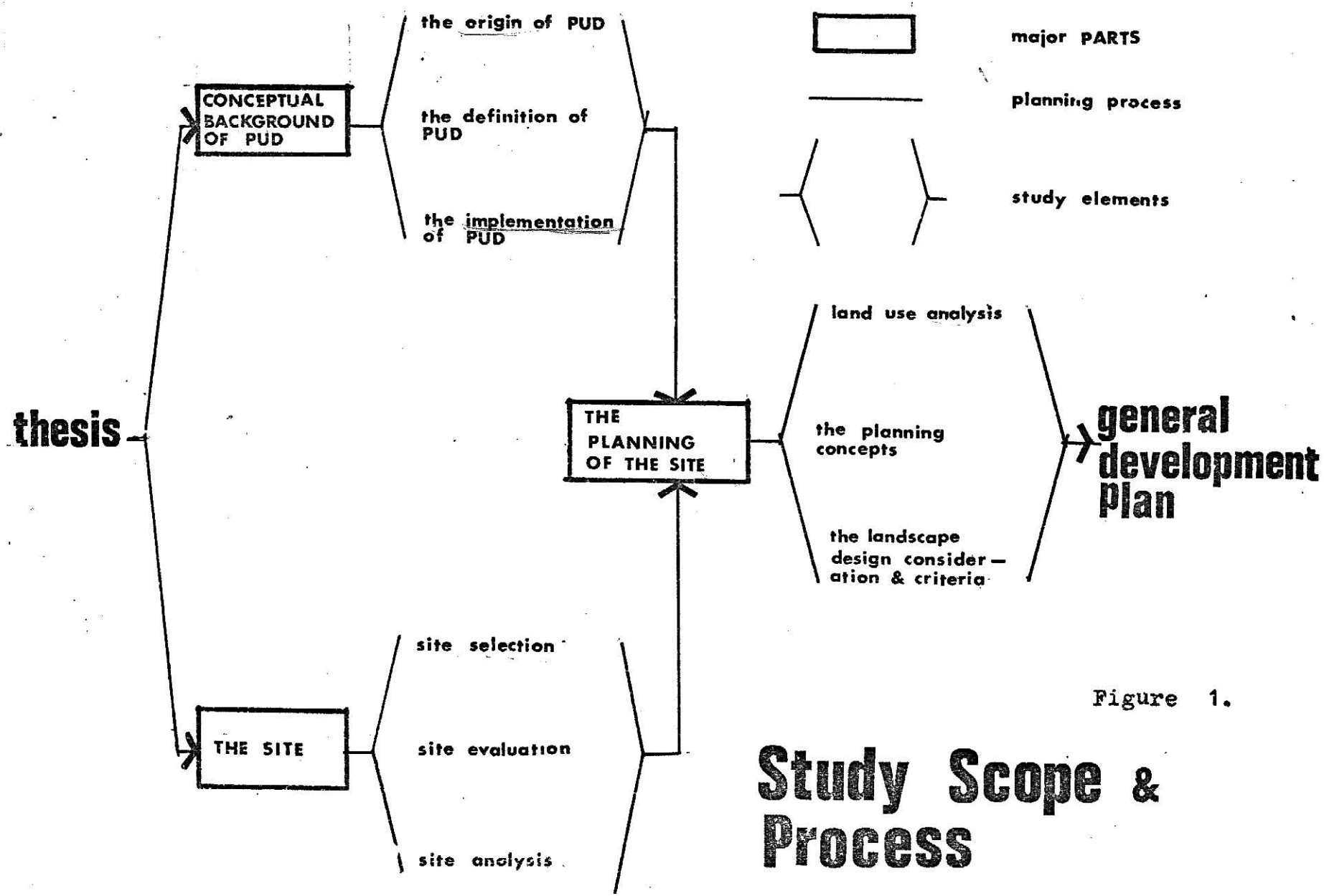

Figure 1.

Study Scope & Process

Part I.

Conceptual Background of Planned Unit Development

CHAPTER I. THE ORGINS OF PLANNED UNIT DEVELOPMENT (PUD)

The concept of planned unit development is not revolutionary, but is an evolutionary extension of the existing land use system.

PUD is a derivative of the most current ideas in planning which call for a program-oriented, mid-range plan, legally binding upon participants. PUD also continues a trend in modern zoning towards flexibility in land use emphasizing a mixture of land uses, unit development, and wide-ranging administrative discretion to local officials. Finally, PUD continues the movement away from present regulation in subdivision control and fosters new interest in the municipal/developer bargaining process. As a result, it offers the developer a more streamlined platting process and potentially large profits in exchange for an increase in the municipality's site review powers and a procedural mechanism for assembling usable amounts of contiguous open space. PUD goes one step further by offering for the first time land use control that enables a municipality to control effectively both the tempo and sequence of an area's development.

A. THE LAND USE SYSTEM

The land use system is composed of a general guide or comprehensive plan and its specific controlling mechanisms, the zoning ordinance and subdivision regulations.

The Comprehensive Plan attempts to dovetail private and public action while providing programmed objectives for a community's future development.

The Zoning Ordinance governs both the use to which the land may be put and the buildings (size,type, numbers,etc.) which may be placed upon it.

The Subdivision Regulations control the initial development of the raw land (design,platting,road placement,etc.) and provide its basic services.

The purpose of the land use system is to promote the health, safety, and general welfare of the local community and its inhabitants. But there are some arguments about this system. Those who support the system believe that the comprehensive plan offers a non-binding, long-term guide to the future, unaffected by provocative temporal issues, and its regulatory zoning and subdivision controls

insure constitutional validity, predictability, simplicity of regulation, and protection of property values.

Those who criticize the system believe that the comprehensive plan is an unobserved, unmanageable document dealing with irrelevent problems over an unrealistic time span, and its reguatory controls are nothing but a means of fostering poorly designed, segregated, and incremental development instead of allowing sensible amounts of land use administrative discretion at the local level.

The central argument turns upon the issue of administrative discretion in the land use control. One side supports increased administrative discretion to local officials, while the other, foes of administrative discretion, question local officials' ability to perform in this new atmosphere of increased land use flexibility.

And PUD is in the midst of this particular controversy. To those who opt for the status quo it is a fadish term for developement controls currently available within the existing land use system. Those opposing the present system claim that PUD is new, strictly, derived for,

and particularly appliable to today's relatively sophisticated land use problems. PUD is the direction in which each specific land use control seems to be moving, particularly in the development areas.

B. THE COMPREHENSIVE PLAN AND PUD

1.THE COMPREHENSIVE PLAN

The comprehensive plan is an official public document adopted by a local government as a general guide for the future development of a political area. It indicates in a general way now the leaders of the government want the community to develope in the next 20 to 30 years. Because it is general and agencies devote more of their time to charting approximations, it is not a piece of legislation. Public expenditure policies, tne official maps, and local regulatory laws are tools which realize the plan's goals.[1]

Comprehensiveness, projection and general policy are its major premises. The plan is the result of the planners' studies of the economy of an area, the social needs of the people, and the physical

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[1] Willian 1. Goodman and others, Principles and Practice of Urban Planning, University of Illinos, 1968, P. 349

characteristics and needs of the community. It consists of recommendations for the use of land, for highways and transportation, recreation, school, areas suitable for various kinds of housing, and needed capital improvements and their priorities.

2. PUD FEATURES DERVIED FROM THE COMPREHENSIVE PLAN

a. A PHYSICAL APPROACH TO SOCIAL AND ECONOMIC ILLS

Currently, the comprehensive plan has two discernable forms, each based upon locational lines and both outmoded. The first one involves high growth suburban and exurban area where the comprehensive plan has retained its long-range physical origins. This kind of comprehensive plan today frequently gathers dust and comes out of retirement decennially seeking additional funding for updating.

The second involves urban area where most of growth is in the form of redevelopment. This kind of plan has become fragmented and unmanageable, consisting of scrambled data, conflicting objectives, and bits and pieces of plans that are an increasingly incompatible mixture.

The first kind of comprehensive plan is criticized

for its narrow physical view and limited application. And the second is criticized for its inability to control effectively any single aspect of growth change.

The PUD ordinance, reacting to both situations, attempts to engage wider substantive concerns, yet express them in realizable, physical development proposals. PUD, although desirous of leaving its mark on the social environment, does so strictly through the employment of improved physical land use measures.[2]

b. LEGALLY BINDING THROUGH ADOPTION BY THE LOCAL GOVERNMENT BODY.

The comprehensive plan has been criticized for not representing official public policy by not having the legislative body officially adopt it. This has probably been the most consistent criticism of the comprehensive plan throughout its history.

The PUD ordinance, however, is an area plan which functions as a regulatory tool to implement the comprehensive plan for a specific section of the community. The PUD ordinance, in fact, does become a part of the community's regulatory controls,

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[2] Robert W. Burchell and James W. Hughes, Planned Unit Development, New Jersey: MacCrellish & Quigley, 1972, pp. 13-14

and since upon project approval it results in an official change of the zoning map, it also becomes binding on private developers. In this broad sense it is the official policy of the municipal government. Yet the PUD ordinance does not represent the entire state of the art in terms of having the comprehensive plan, or part of it, adopted by the local government.[3]

c. DEALING WITH CURRENT PROBLEMS WITHIN A REALISTIC TIME SCHEDULE

The comprehensive plan has been further criticized for its inability to deal with current problems or to focus its attack within realistic time periods.

The PUD ordinance is an updating of this aspect of the land use system. In this sense it is nothing more than a " middle range bridge " filling an obvious gap in the existing land use planning process.

The development proposal, required by the PUD ordinance, is a programmed document calculated for no longer than a mid-range, 10 to 15 years period. Its span is much shorter sometime, frequently in the range of 5 to 8 years. The proposal contains

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[3] Ibid, p. 15

specific targets in terms of number of residential housing units, gross square footages of industrial and commercial uses, amounts of common open space and inclusive recreation facilities, and necessary municipal services and local public utilities.

In summation, PUD's derivatives from the comprehensive plan is a procedure whereby pertinent and realizable problems are addressed in a legally-binding program of mid-range objectives.[4]

C. THE ZONING ORDINANCE AND PUD

1. THE ZONING ORDINANCE

Traditional zoning ordinance is reflected in the Standard Zoning Enabling Act which is the basis of most present-day legislation in the United States. Zoning is established dividing all land of a community into districts within which certain uses are permitted and restrictions on building, height, and bulk layout are defined without the need for individualized administrative treatment.

Historically the districts were few in number, large in size, and cumulative from single

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[4] Ibid, p. 16

family homes to relatively unrestricted use. The applicable zoning ordinance was characterized both by its strict definition of uses and rigid regulations governing uses, in an effort to define specidically both type and intensity of land use. When all specifications were considered as a whole they constituted a predictable and protective classification of buildings and property which would bring about the orderly physical development of the community and maintain and conserve the economic value of predesignated land parcels.

The typical zoning ordinance, for example, established the usual single-family residence districts, a series of multi-family districts, several types of commercial districts, and possibly several industrial districts. The purpose for this segregation of uses is to prevent the mixing of incompatible uses and to insure the uses requiring expensive public service facilities.

2. PUD FEATURES DERIVED FROM ZONING ORDINANCE

a.A MIXTURE OF LAND USES

Traditionally zoning is criticized for dividing a community into districts emphasizing the explicit segregation of uses rather than the mutually

re-enforcing compatibility of uses. This criticism has led to the adoption of PUD ordinances which emphasize both a mixture of dwelling types and land uses as part of the planned development concept.

b. UNIT DEVELOPMENT

Traditionally zoning is also criticized for developing the lots individually at a time. PUD is an area of land controlled by a landowner, to be developed as a single entity. In other words, PUD's design, construction, operation, and maintenance consider the total living environment, rather than just one piece lots. It calls for converting a parcel of land to an integrated complex of living units with necessary and complementary relationships, rather than merely building houses on individual lots. Depending on its location, a PUD may be able to take advantage of streams, trees, terrain, and inspiring scenic values.

Throughout a PUD, lot size requirements, yard requirements, height requirements, and other similar zoning control can be eliminated. In unit development, the fundamental land use control is the floor-area ratio which tells the developer how many square feet of building floor area he may put on a given number of squate feet of land. He may divide this floor area

among as many as he wishes. He is also free to both place abd arrange structures, and select type of dwellings in the development of his land.

c. INCREASED ADMINISTRATIVE DISCRETION

The final and the most valid criticism of traditionally zoning is the limits of administrative discretion. The current system of zoning has the idea that government must act in a general and impartial manner to avoid discrimination, favoritiam, and political pressure. Thus it is predictable that those who implement zoning have made only reluctant moves to allow greater administrative freedom to pervade the land use bureaucracy.

Apparently, piecemeal development and a deteriorating landscape have caused most planners to forsake caution and advocate increasing administrative control to a single and powerful government land use body.

PUD advocates moved quickly in strong support of the consolidation of administrative procedures in one central agency, preferably the planning board. The planning board currently has the authority to grant or deny the PUD application and thus completely rezone the tract in question without

resort to legislative action.

In summation, PUD takes from the zoning a means of providing a mixture of residential, commercial, and industrial land uses, a unified development control on a greater than single lot basis, and a consolidated, administrative review of specific development proposals.

D.THE SUBDIVISION REGULATION AND PUD

1. SUBDIVISION REGULATION

Subdivision regulations are locally-adopted laws governing the process of converting raw land into building sites. It often requires positive exactions of the developer such as the construction of streets or sewers, the posting of a performance bond guaranteeing the durability of improvements for a certain time period, and,perhaps, the conveyance of a portion of his land to the municipality for intended public uses.

The purpose of subsivision control is to guide orderly future municipal growth along preconceived lines, to protect the prospective residents and neighboring owners from poorly designed or carelessly constructed areas, and to insure that the cost of municipal improvements to a subdivision are borne by the residents who

will ultimately derive this benefit.

The subdivision regulations normally can be accomplished through plat approval procedures, under which a developer is not permitted to make improvements or to divide and sell his land until the planning commission has approved a plat of the proposed design of his subdivision. The approval or disapproval of the commission is based upon compliance or noncompliance of the proposal with development standards set forth in the subdivision regulations.[5]

a.DESIGN REQUIREMENTS

With regard to the design and layout of developing areas, legislation frequently give the municipality power to establish certain minimum standards for width and alignment of new streets, dimensional requirements for blocks and lots, and locational guides for proposed utility easements.

Most statutes and ordinances provide that all new streets must conform to the " mapped streets ordinance " or " major street plan ". They also provide that new streets must be of sufficient

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[5] Goodman, op. cit. p. 445

width and alignment to mesh with those already in existence.

The layout requirement of blocks include maximum/minimum lengths of blocks employing through streets or pedestrian ways or utility easements at a lot's boundaries.

Finally, the arragnement of lots with respect to utility easements is done so as to minimize the number of properties either facing or divided by such facilities and to permit a reasonable dedication of land so that municipal personnel may regularly service these activities. In general, utilities are located in street beds, or dedicated easements, thereby elimininating extensive subdivision rearrangements.

b. IMPROVEMENT REQUIREMENTS

Improvements required of the developer are primarily concerned with streets, neighborhood facilities and with utility systems.

The municipal regulation of streets requires that streets in a new subdivision be graded and paved to minimum city standards.

Closely related to grading and paving requirements are those of curbs, gutters, drainage, and sidewalks. These improvements must be completed and of certain

material standards to prevent wash out.

The cost of the extension of utility systems to outlying areas is a burden of municipality. But this burden has been shifted to the developers. The developer creates the need for services and subsequently should pay for them. The land purchaser, upon whom the ultimate burden falls, receives these costs as part of his housing package usually in lieu of a subsequent anf much more costly special assessment.

c. DEDICATION / RESERVATION OF LAND

It has always been considered the developer's responsibility to furnish the land needed for streets and public utilities. This was not merely custom but was required by charters and provisions of statutory and common law. Thus the requirements in subdivision control that developers dedicate street rights of way and utility easements are nothing new but merely a continuation of an old tradition.

In fact, the developer usually wants to dedicate the streets or to donate space for utilities since through the addition of a street he is creating more buildable lots; and by providing attendant utilities he is making each of these

entities more marketable.

However, the requirement of dedication of land for schools, community centers, and other similar functions is more questionable, depending on judicial interpretation of state laws. If no state law exists, a developer may also be required to dedicate land for schools, parks, and playgrounds if they are in proportion to what the residents of the new subdivision would actually require and consume.

Legally, reservation of land is not as severe a burden on the property owner as dedication and thus is usually accepted as a valid regulation by the court.

The purpose of the reservation is to forestall construction on the reserved site to give the municipality time to reach a decision as to purchase. For the advantage that the municipality derives in terms of extended planning time, the developer may be granted compensation, i.e. some form of tax abatement.

2. PUD FEATURE DERIVED FROM THE SUBDIVISION REGULATION

a. SITE PLAN REVIEW

Most standards in the subdivision regulation

are preset. In many cases they are specifically geared to the most common land subdivision, i.e. the single-family residential dwelling unit located on a flat and unblemished terrain. When these regulations are applied in non-normal residential situations(rugged terrain, cluster dwellings, old-shaped lots) they don't fit.

The PUD ordinance with specific provisions relating to site plan review provides a procedure which can relate the type, design, and layout of residential, commercial, and industrial development to the partixular site.

PUD has not itself fostered site plan review. Site plan review is a growing part of subdivision regulation. PUD has merely recognized the value of this area of regulation and synthesized it within its means of land control.[6]

b. A STREAMLINED PLATTING PROCEDURE

The conventional platting procedure works against large-scale development for several reasions.

The first reason is the fact that before a developer can receive a building permit and offer realty for sale he must acquire final plat

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[6] Burchell, op. cit. p. 27

approval for his entire project - a very expensive process. In most cases this requires that he undertake detailed engineering studies and surveys, prepare a site plan, and post bonds for public improvements.

The second reason is that the current platting procedure is a lack of assurance that a municipality will not noticeably alter its existing subdivision requirements while the project is underway.

But in PUD, the developer is allowed to file a tentative plan, proceed in stages, and is given assurance that the municipality's standards will not change during the period between tentative and final plat approvals.[7]

c. A MEANS OF ACQUIRING AND MAINTAINING OPEN SPACES

The requirement of dedication at subdivision approval of developer's land for parks, schools, etc., is firmly established.

This system is inefficient since land obtained in this way is often fragmented and difficult to maintain. Using clustering dwelling units, PUD can obtain more open space which is not fragmented

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[7] Burchell, op. cit., pp. 28-29

but integrated and easy to maintain.

In summation, deficiencies in subdivision control have provided the impetus to generate a means of dealing with a necessary increase of the site plan review function, a reduced platting requirement for large-scale development, and the acquistion and maintenance of common open space. PUD does not initiate, but evaluates and carefully selects efficient means of land use control.

CHAPTER II. THE DEFINITION OF PLANNED UNIT DEVELOPMENT

A. WHAT IS PLANNED UNIT DEVELOPMENT ?

PUD has many definitions and the concept is still undefined. However, since the PUD concept is an evolutionary extension of existing land use system, the elements in the definitions of PUD are to be similar to those which PUD has retained in its emergence from the existing land use system.

They have been identified earlier and summarized as below:

PUD FEATURES DERIVED FROM THE EXISTING LAND USE SYSTEM[8]

ELEMENTS OF THE LAND USE SYSTEM	CRITICISMS OF EXISTING SYSTEM ELEMENTS	PUD MECHANISM
Comprehensive plan	long range plan	(1) mid-range program
	Not adopted by local legislative body	(2) Adopted and followed by legislative body
	Deal with irrelevant problems seeking unrealizable goals	(3) Deal with pertinent problems seek-realizable objectives
	Segregation of uses emphasizing disharmony	(4) Mixture of uses emphasizing compatibility.

	Single lot focus- incremental devwlop- ment	(5) Unified control- unit development
Zoning ordinance	Preset regulations- disparate municipal administration	(6) Administrative discretion- a single municipal land use body
	Automatic disposal- limited design control	(7) Necessary site plan review- extensive design control
	Fractional and useless open space contributions deeded to municipal for public use	(8) Significant open space maintained by residents for private use - special usable sites dedicated for public use
Subdivision regulation		
	Formal one short, platting procedure, extensive expense via utility commitments by developer	(9) Staged platting procedure self-contained unit; limited expense to developer.

8 Burchell, op. cit. p. 35

One of the early definitions of planned unit development is offered by Babcock, McBride, and Krasnowiecki :

" PUD is an area of land controlled by a landowner, to be developed as a single entity for a number of dwelling units, the plan for which does not correspond in lot size, bulk, or type of dwelling, density, lot coverage, and required open space to the regulations established in any one residential district created, from time to time, under the provisions of a municipal zoning ordinance enacted pursuant to section of Chapter. "

Compared to Table 1 this definition is limited and coveres only area (5) and (6) of the derivative elements.

Daniel Mandelker, restating point (5) and (6), added the concept that PUD may include a mixture of land uses, point (4) " Planned development regulations mark a substantial departure from rraditional. First, they apply to entire developments rather than to individual lots. Second, planned development regulations abandon or substantially modify the traditional, self-executing from of zoing regulation. Finally, planned development regulations may also represent a partial or total abandonment of use districting."

The Department of Housing and Urban Development, Maryland, introduced that the idea that planned unit development was to proceed in accordance with a plan. point (1) " PUD is land under unified control planned and developed as a whole according to comprehensive and detail plans. The PUD is a development which follows a plan prepared under general standards which may be different from those which would have been applicable to the site."

Roger Scattergood recognizes that both the provision and control of open space are also constituent elements of most planned unit developments. Point (8) " Another provision often found in PUD regulations is the requirement that common open space be dedicated for use of the neighborhood and not necessarily the general public.

PUD has privately owned common property comprising an essential or major element of the development, sucj as an internal park network abutting homesites in a super-block or cluster subdivisions."

Isadore Candeub sees that PUD must be approved by the governing body, point (2) if they are to represent public commitments to action which cannot be waived when the occasion warrants.

Finally, the American Society of Planning Officials report for Connecticut, states that an important aspect of PUD which must be considered is that if PUD is sufficiently large it can be developed in stages, point (9). The developer is not harnessed with an initial financial drain and is assured that the community's requirements will not change during later stages of development.

An additional element which is very much a part of PUD, but is not a derivative of the existing land use system, is PUD's ability to control part of a municipality's tempo and sequence of development.

The definitions of PUD mentioned above are all limited and cover only some areas of the derivative elements. A well-covered and integrated description of PUD will then be the one, defined by Robert W. Burchell:

" Planned unit development is a means of land regulation which promotes large scale, unified land development via mid-range, realizable programs in pursuit of physically-curable, social and economic deficiencies in perpheral land and city-scapes. Where appropriate this development control

advocates : (1) A mixture of both land uses and dwelling types, (2) The clustering of residential land uses providing public and common open space, the latter to be maintained for and by the residents of the development. (3) Increased administrative discretion to a local professional planning staff which while setting aside preset land use regulations and rigid plat approval processes, and finally, (4) The enhancement of the bargaining process between developer and municipality thereby strengthening the municipality's site plan review function and control over tempo and sequence of development in return for potentially increased profits available to the development as a result of land efficiency, the employment of multiple land uses, and increased residential densities. "

B. CLASSIFICATION SCHEMES

PUD can be, in general, classified by compostion, size, and geographical location.

1. COMPOSITION

Mandelker segregates PUD according to four stages of land use sophistication, from" density transfer systems " to " mixed use developments " :

a. Density transfer systems - all uses of the same type with the same average overall density.

b. Varying residential types - single family versus apartments but with no increase in overall density.

c. Varying residential types, allowing density increase according to designated standards.

d. Mixed use projects - residential, commercial, industrial allowed in a large area.

2.SIZE

In terms of size, the Regional Planning Council of Baltimore's Classification is probably tne most viable. It groups PUDs in three categories from 100 to 2,500 acres.

a. Neighborhood PUD types which range from 100 to 200 acres.

b. Community PUD types which range from 400 to 800 acres.

c. Town PUD types which range from 1,000 to 2,500 acres.

3.GEOGRAPHICAL LOCATION

Anthony Downs classifies PUDs as " in-city", " peripheral ", " satelite " and " autonomous" in terms of geographical location.

C.ADVANTAGES AND DISADVANTAGES OF PUD

1. ADVANTAGES OF PUD

The advantages of PUD follow basically from its definition and origins :

a. Improved design with greater variety.
b. A wider choice of housing available to more people in one community.
c. More useful open space.
d. More convenient shopping facilities.
e. Economy in space for streets and in lengths of utility, water and sewer lines.
f. Increased density
g. Lower costs.

2.DISADVANTAGES OF PUD

. . The disadvantages of PUD do not come from the concept itself, but on the ability of the participating agents to embrace the conceptual changes which PUD represents. Specific criticism is directed toward :

a. The planning board for its continued lack of development sophistication.
b. The governing body for the creation of a bargaining process which excludes the ultimate consumer, the possible misuse of PUD legislation to forestall all local growth.

c.The developer for his continued embracement of long-range management tasks too sophisticated for his organizational structure and too prolonged for his limited cash flow.

D. HISTORICAL EVOLUTION

The planned unit developments probably had their legal genesis in the garden apartment developments which became popular just prior to and after World War II. Most zoning ordinances at that time spoke in terms of required lot areas and front, side, and rear yards, but in these developments such requirements made little sense. The owners held the entire development in single ownership, renting individual units to tenants, and it would have been foolish to require them to subdivide the tract into lots so that zoing officials would have some lines from which to measure yard sizes.

The next step in this evolution was the appearance of " variable density " provisions in zoning ordinances. Noting the fact that the over-all density control found in the garden apartment provisions had worked well, some planners began to

experiment with provisions under which developers would be given the same latitude to vary lot sizes within a subdivision as they had in garden apartment developments. So long as the total number of dwelling units in a tract remained the same, there seemed little reason to require that they have lots of uniform sizes, where the developer chose to build on smaller lots, the space thus saved would be dedicated to tne public for parks or other public purposes. In the subdivision regulations such provisions came to be known as cluster subdivision provisions, since it usually was desirable for a variety of reasons to group the smaller lots in clusters.

At the same time that this development was taking place, there were arguments that it was desirable both from a sociological standpoint and from the standpoint of architectural aesthetics to vary not only lot sizes but also dwelling types within a subdivision, ranging from single-family residences through row houses and garden apartments to high-rise apartment units.

Finally, as development grew in scale to encompass neighborhoods and entire new town, communcial and industrial uses were added in such developments.[9]

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[9] Goodman, op. cit. pp. 480 - 481

CHAPTER III. THE IMPLEMENTATION OF PLANNED UNIT DEVELOPMENT

A. PROJECT APPROVAL

1. APPROVAL PROCEDURE

In terms of procedure, most proposals are submitted directly to the planning board which confers with other government agencies and then recommends approval or disapproval to the governing body. Within a specified time period after application a public hearing is held and the project is either approved or disapproved. The PUD ordinance spells out in detail what evidence is required for presentation at this hearing.

If the project is granted tentative approval, application for final approval may be made at once or in stages. No hearing is required for the final plan if it is in substantial compliance with the previous plan given tentative approval. If the staged plan is opted for, upon compliance with the tentative plan, final stage approval is also given without hearing.

2. CONDITION TO BE MET PRIOR TO APPROVAL

The grant of approval of a PUD is based on the fulfillment of certain conditions. These are general standards covering such areas as type of

control, minimum size, permitted uses, maximum density, and the provision of open space and public facilities. Each of these are formidable and essential parts of the PUD process.

In the case of development control, approval is based upon demonstration that the area is under unified rather than fragmented control. This may be accomplished either by single ownership, long-term lease, agency, or other legal device.

a. The minimum size requirement is a requirement less often found than others for project approval. Minimum size will vary witn the type of development and specific location. It may be stated eitner in terms of dwelling units or acres.

b. The minimum density requirement is a more frequent provision in PUD ordinance. It is regulated by either a maximum number of units per acre or by a minimum lot area for each dwelling unit, including a share of common open space. The increasing in density is permitted sometimes as a bonus for meeting certain design criteria, or at the discretion of the local planning board.

c. Permitted land uses are usually found in the form of acceptable percentage of residential, commercial, and industrial land usage.

d. The requirement for open space contains provisions covering its quantity, location, and maintenance. The first requirement is either stated as a minimum acreage requirement per " X" dwelling units or as a direct percentage of the gross acreage. The second requirement requires planning board approval of the proposed location of open space. Finally, miantenance of open space may be assigned to the residents of the development in the form of " Homeowers Association " or to the municipality upon the land's allocation for public use. The former is the legal device most extensively used.

e. The provision of community services is essential to the PUD process. Most of the necessary utility "hardware" is mandated directly by the PUD ordinance. Other requirements such as land for schools and emerging facilities, or the capital structures themselves, become part of the municipal/developer bargaining process.

f. The on-going preservation of the PUD as planned is an essintial guarantee. The final development plan controls the development after it is finished. No subsequent major structural or use change will be permitted unless approved by council. Similarly, minor changes must be approved by the planning board. Subsequent subdivision of the land is discouraged, but if permitted, must meet the basic requirements of the local subdivision ordinance.

3. HUD- FHA REQUIREMENTS

Ther are some special requirements to be met if HUD (U.S. Department of Housing and Urban Development), through the FHA (Federal Housing Adiministration), is involved.

First, the developer should formulate a general development program in which the size, type, and approximate number of living units, the approximate size and number of buildings, and the approximate amount of open space, outdoor nonvehicular livability space, recreation space, and car storage space are determined. The development program also includes the type of water and

sewerage facilities and any other features affecting the physical and financial feasibility of the development.

These basic plan elements should be agreed upon tentatively by HUD - FHA, the local planning board, and other interested parties, before preliminiary plans are started.

The proposed development program must provide for a planned unit which (1) is appropriate to the characteristics of the site and its location in the anticipated community pattern, (2) provides for properties which will compete successfully for a definite and continuing demand in the housing market, (3) is capable of satisfactory use and operation as a separate entity without necessarily having the participation of other building sites or other common property, and (4) is within the capacity of the sponsor to complete within a reasonable time.

If the first step goes well, then the developer can prepare the preliminary development plan for approval. In this matter, HUD requires that (1) the overall planned unit development must provide adequately for dwellings, open space, nonvehicular

livability space, recreation space, car storage space, pedestrian and car movement, light, air, service, and all other needs of the development when fully populated. (2) the design must be at a land use intensity appropriate to the site and its location,and must comply with the site planning section requirements of the Minimum Property Standards. In general, it must produce a stable and desirable residential environment. (3) the common property owner and operated by the home-owners association, as well as other subdivision elements such as public streets, water and sewage facilities also must meet appropriate HUD standards.[10]

There are also some legal " must " which HUD - FHA requires in connection with agency approval of a PUD. They deal with proper establishment of the Home Association, its financing and the rights and responsibilities of the homeowners in relation to use, management, and ownership of common property.

If the second step goes well also, then the developer goes on through final planning and

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[10] Planned - Unit Development with A Homes Association, U.S. Department of Housing and Urban Development, 1973, pp. 52 - 55

construction and in accordance with usual HUD-FHA procedures for a proposed subdivision of home properties with HUD -FHA insured home mortages.

B. THE HOMES ASSOCIATION AND MAINTENANCE

1. TYPES OF ASSOCIATION

A homes association is an incorporated, non-profit organization operating under recorded legal agreements running with the land. Under such agreements, the association may be formed on the basis of either voluntary of automatic membership.

a. The voluntary or non-automatic association operates with land agreements but with membership and assessments optional with the lot owner and discretionary on the part of the organization management. Mostly a voluntary association of property owers is used for operation of community clubs or for recreational features, such as a swimming pool or golf club wherein the developer provides the facility and continues his patronage and ownership. The covenants or other documents of title are not recorded and incorporated with each deed of conveyance.

b. The automatic membership association is one in which each lot owner in a planned unit automatically

becomes a member upon purchase, and each lot is automatically subjected to a charge for the organization's activities, such as maintaining common property.

Though many types of organization have been employed, the automatic homes association is shown by the evidence of case histories to be the most dependable and to be the only way to handle common open spaces.

2. LEGAL FOUNDATION

The covenants and other land agreements should establish in the beginning a scheme of land development which protects the investments of home buyers and mortgage landers, yet leaves sufficient power with the developers to create and marker the development successfully.

Before the plat has been recorded and the first lot sold, the developer should (1) create an incorporated, non-profit homes association, and (2) record covenants which automatically make every lot owner an association member, give him the right to use the common property, and establish his voting right in the association and his obligation to pay its assessments.

Concurrently with recordation of the subdivision plat, the developer should establish for each lot owner the right of enjoyment of the common area and should assure the preservation of the common area for its intended purpose.

3. ASSOCIATION FINANCES

Association assessments should be set to cover contingencies and replacements as well as working capital, operating expenses, and insurance. Upon the association's request some mortagage lenders collect association assessments from the home owner as part of his monthly mortagage payment along with such items as taxes and fire insurance.

4. CREATING AND OPERATING THE ASSOCIATION

During development, the developer should find and carefully develop homeowner leadership of the association and coach it in association operations. In the later stages of the development, the developer should gradually transfer responsibilities for association operations to the homes owners.

The operations of associations can be controlled by meeting of members or director and its officials.[11]

[11] J. Ross Mickeever, ed. The Community Builder Handbook, Washington D.C. : Urban Land Institute, 1968, pp. 195-201

5. USING AND MAINTAINING THE COMMON PROPERTY

Common park and recreation areas can be used satisfactorily by volunteer supervision and coaching. Part - time, period staffing for recreation program is practical and desirable too. A planned recreation program gains full use of common area and arouses membership interest in association affairs.

The establishment and maintenance of turf and planting are the most common maintenance problems. Satisfactory maintenance is standard performance from homes association properly set up with adequately financ and effective leadership.

In summation, as far as the actual physical elements are concerned, the PUD consists of the association -owned common property, the public street, and the indivisual homes. Each serves a particular function, but are all closely interrelated.

Among the elements, the homes association is the cohesive force that makes the whole thing work. As a matter of fact, where municipal services are not available in the early stages of PUD development,a homes association will perform municipal type services.

C. THE MANAGEMENT OF THE PLANNED UNIT DEVELOPMENT

The management of planned unit development may vary. Some planned unit development is operated on a day - day basis by a manager who is an employee of the homes association, others a professional management firm may perform these chores, still others it may be some members themselves who operate the project.

Part II.

The Site

CHAPTER I. THE SITE SELECTION

A.SITE LOCATION

The selected site is located at the southeast boundary of Junction City, Kansas, and is about two miles away from the downtown area of the City.

The tract containing a total of approximately 140 acres is divided into three pieces by a north-south Highway U.S. 77 and an east-west Ash Street. (Figure 2)

B.DEVELOPMENT POTENTIAL OF THE SITE

1.REGIONAL DEVELOPMENT TRENDS

In the past ten years, the population of kansas has increased approximately 3.1 percent to reach over 2,246,578 in 1970. By 1980, the population of Kansas is expected to approach 3,000,000.

With the growth of the population, the rate of urbanization of Kansas is increasing. Of the 2,246,578 people residing in Kansas in 1970, over 65 percent reside in the urban centers. Junction City,being a major urban center ,therefore, will have a positive future as far as the population and urbanization of Kansas are concerned.(Table 1)

Junction City is located along the route of I - 70 U.S. Interstate Highway, which traverses the center of United State and Kansas. As the

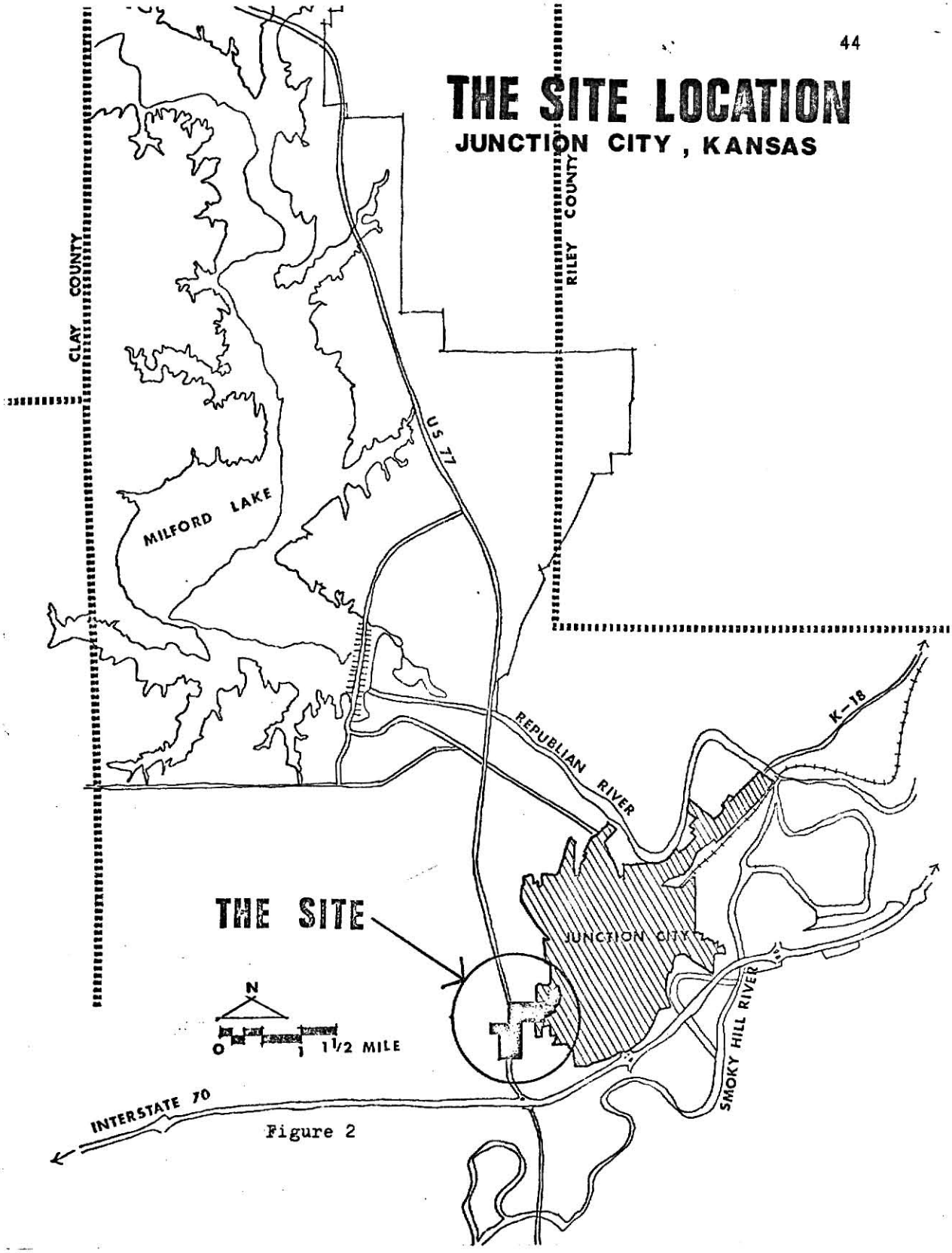
THE SITE LOCATION
JUNCTION CITY , KANSAS
CLAY COUNTY
RILEY COUNTY
US 77
MILFORD LAKE
REPUBLIAN RIVER
K-18
THE SITE
JUNCTION CITY
SMOKY HILL RIVER
N
0
1
1 1/2 MILE
INTERSTATE 70

Figure 2

POPULATION OF KANSAS STATE
CENSUS TO 1970.

			1970	1960
The State	Population		2,246,578	2,178,611
	Change From Preceding Census	Number	67,967	273,312
		Percent	3.1	14.3
Urban	Population		1,484,870	1,328,741
	Change From Preceding Census	Number	156,129	355,521
		Precent	11.8	33.8
Rural	Population		761,708	849,870
	Change From Preceding Census	Number	-88,162	-62,209
		Preceding	-10.4	-6.8
Percent of total	Urban		65.3	61.0
	Rural		34.7	39.0

SOURCE : 1970 U.S. Census of Population.

TABLE 1

result of the advantage of I -70, which provides excellent access, Junction City is expected to be extended.

The development potential of the site, therefore, is postive as far as regional development trend is concerned.

2.LOCAL DEVELOPMENT TRENDS

a.POPULATION

Population is a critical factor in analyzing the development potential of a community. From the study of population, a outlook of the community can be made.

The population of Junction City has recorded increases over the last two Census periods. The troops at Fort Riley have been a strong influence on the population of Junction City. According to Census data, the population of Junction City increased 3.8 percent per year between 1950 and 1969 when the troop strength of Fort Riley was normal. From 1960 to 1970, with severe troop cutbacks at Fort Riley, the population of the City increased only 0.2 percent per year.

Since Fort Riley has returned to normal troop strength after 1970 and is expected to

remain fairly stable in future years, a 3.3 percent a year increase appears to be feasible for the projected growth of the Junction City area.[12]

Therefore, the most realistic outlook for Junction City's population is for an increase to about 41,800 by 1995. This projection assumes a stable increase of 3.3 percent per year. (Table 2)

In fact, no absolute predication of future population can be made for any community. The1995 population of 41,800 might be achieved as early as 1990 or as late as the year of 2000.

The important fact, however, is that the population of Junction City will be expected to grow in the future. As result, more land will be needed to be developed.

b.ECONOMY

The economy of an area is one of its prime human resources, it is also a critical factor in analyzing the development potential of a community.

The major economic supports of Junction City are Fort Riley, agriculture, Milford Reservoir, and county government and retailing.

With the return to normal troop strength at Fort Riley in 1970, millions of dollars have been spent in the Junction City area. (Table 3)

POPULATION PROJECTION, JUNCTION CITY, GEARY COUNTY.
1950 - 1995

Year	Population
1950 [1]	13,462
1960 [1]	18,700
1970 [1]	19,018
1975 Jan. 1 [2]	21,857
1980 Jan. 1 [2]	25,708
1985 Jan. 1 [2]	30,237
1990 Jan. 1 [2]	35,563
1995 Jan. 1 [2]	41,800

[1] U.S. Census

[2] Estimates are based on a 3.3 percent a year increase for every year after the 1970 Census.

Source : Oblinger - Smith Corporation, Consultants in Planning, Design and Development, 1973.

TABLE 2

TROOP STRENGTH AT FORT RILEY,
1960 - 1972

YEAR (AS OF JANUARY 1)	MILITARY PERSONNEL ASSIGNED
1960	16,919
1961	17,781
1962	20,927
1963	15,675
1964	14,972
1965	19,431
1966	2,789
1967	10,000 *
1968	25,000 *
1970	25,000 *
1972[1]	17,184

[1] As of November, 1972.

* Approximately.

SOURCE : Fort Riley Post Information of Officer, 1972.

TABLE 5

Agriculture in the Junction City area is in sharp transition. while employment in agriculture has been decreasing, the value of farm products sold has risen. Thus, trends indicate that agriculture will continue to be a strong support of the economy of the area.

Milford Dam, located northwest of Junction City, is increasing its influence as an economic asset to Junction City area. Since its opening, visitors have been increasing each year to an annual current total of 1,912,996 in 1972. (Table 4)

Due to the fact that Junction City is the County seat, the City may look to County government as an " industry " since local government is one of the fastest growing employment sectors, and Geary County employment will increase to create a large job base in the City. The activities of retailing, banking, insurance, real estate and professional services serve a trade area much large than Junction City. To a certain degree, these activities will continue to work for Junction City's growth with expansion of trade area population and purchasing power.[13]

Ibid. pp. 15 - 24

NUMBERS OF PERSONS VISITING MILFORD LAKE, 1967 - 1972.

Year	Attendance
1967 (July to December)	498,194
1968	1,069,006
1969	1,382,218
1970	1,576,981
1971	1,274,353
1972	1,912,996

SOURCE : Leland Brown, Lake Manager for the Corps of Engineers, 1972.

TABLE 14.

In summization, the economic outlook for Junction City appears to be bright with major economic support. So a steady growth of the City can be expected in the future.

The development potential of the site in the Junction City area, therefore, will be positive as far as population and economic are concerned.

CHAPTER II. SITE EVALUATION

A. CHARACTER OF URBAN GROWTH

Natural physical barriers in the Junction City vicinity occur as hilly topography laced with stream valleys. The thin and rocky soils in the upland will discourage the expansion of the City to the northwest. And the broad river valleys of the Republic River and Smoky Hill River have dis-discouraged the expansion of the City across its courses to the north and the east.

A man - made barrier in the Junction City area is the Interstate Highway I-70, which is a major east-west four-lane divdided freeway with complete control of access. This Highway passes Junction City at the south edge of the City, and will discourage the expansion of the City to the south.

There are no barriers in the direction of the southwest . Therefore, the main stream of growth of Junction City is expected to be in this direction, and the selected site for development is located in the southwest section of Junction City. (Figure 3)

B. ACCESSIBILITY OF PUBLIC SERVICE

1. STREETS

The site is directly served by two local streets (Ash and Mcfarland) both of which connect

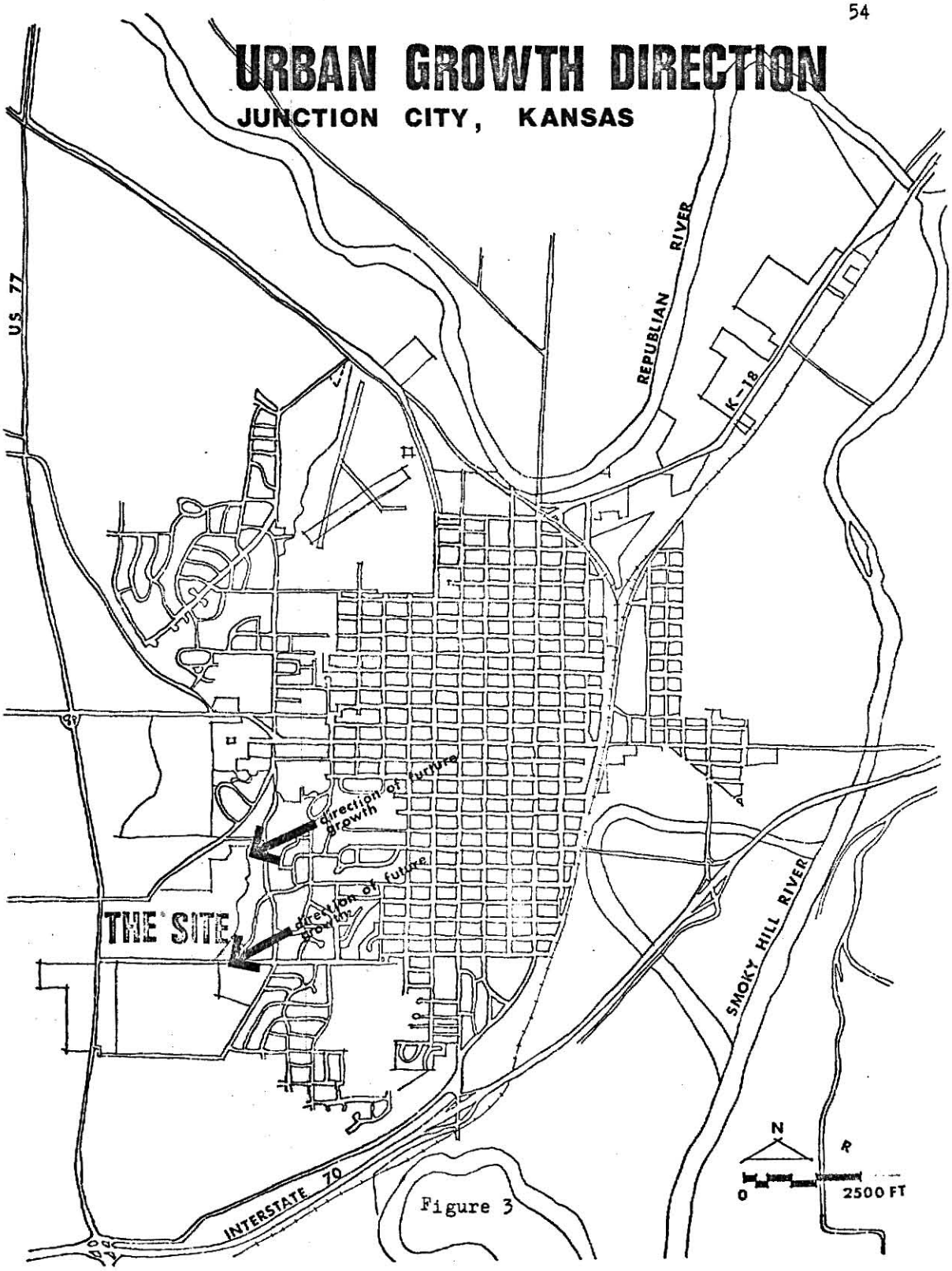
URBAN GROWTH DIRECTION
JUNCTION CITY, KANSAS
US 77
REPUBLIAN RIVER
K-18
direction of future growth
direction of future growth
THE SITE
SMOKY HILL RIVER
INTERSTATE 70
N
R
0
2500 FT

Figure 3

to existing major streets of Junction City and provide excellent access to the site from the west and the north. By using these two local streets, the site is about two miles away from the downtown area of Junction City.

U.S. 77, a major north-south highway, runs through the site and provides the site with convenient access to Junction City on the east, Wichita and Oklahoma on the south, Nebraska on the north, and Milford Lake - the largest lake in Kansas and most popular recreation area- on the northwest.

Interstate Highway I-70, a major east-west freeway, passes the site on the south. The freeway provides the site with excellent access to the cities of Topeka, Kansas City to the east, and Denver to the west by the intersection Exit 295 and Exit 296. Exit 295 is about 4,000 feet from the site and the Exit 296 is about two miles from the site. (Figure 4)

2. AIR SERVICE

The Manhattan Municipal Airport is located approximately 16 miles northeast of the site . The airport provides scheduled commercial air line service and air taxi service. Frontier

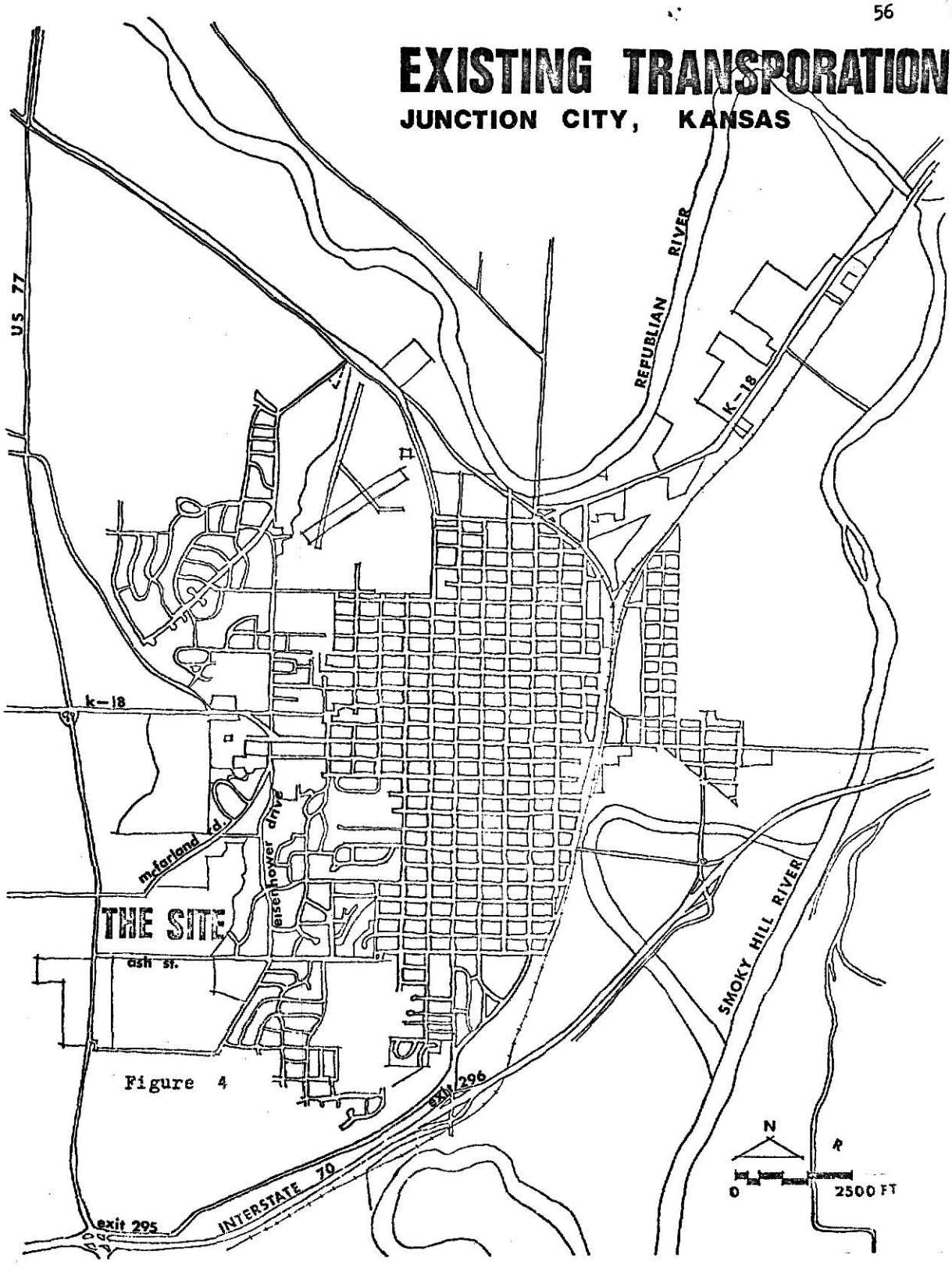
EXISTING TRANSPORATION
JUNCTION CITY, KANSAS
US 77
REPUBLIAN RIVER
K-18
k-18
mcfarland rd.
eisenhower dwy
THE SITE
ash st.
SMOKY HILL RIVER
exit 296
INTERSTATE 70
exit 295
N
0
2500 FT

Figure 4

Airline provides scheduled flights to Denver and the new Kansas City International Airport. Capital Air Service Inc. provides air taxi service to Kansas City on an basis of 16 scheduled flights daily.[14]

3. UTILITIES

The Junction City's water distribution system, which is generally well planned, presently serves only the built-up area within the City limits. Because the site in located outside the City limits,[15] no water lines serve the site at the present time. However,since the location of the site is so close to the City, actually adjacent to the City limits, it is anticipated that no problems will occur for the site to get water by connecting new water lines to the existing water mains which run under the Ash Street and Mcfarland Road. (Figure 5)

Like the water system, the sanitary sewer system of Junction City serves only the area within the City limits and , therefore, no sanitary sewer is available in the site itself presently. However, in the site area some existing sanitary sewers run very close to the site. The sanitary sewer installed under the Mcfarland Road is only 600 feet away from the site and the one installed

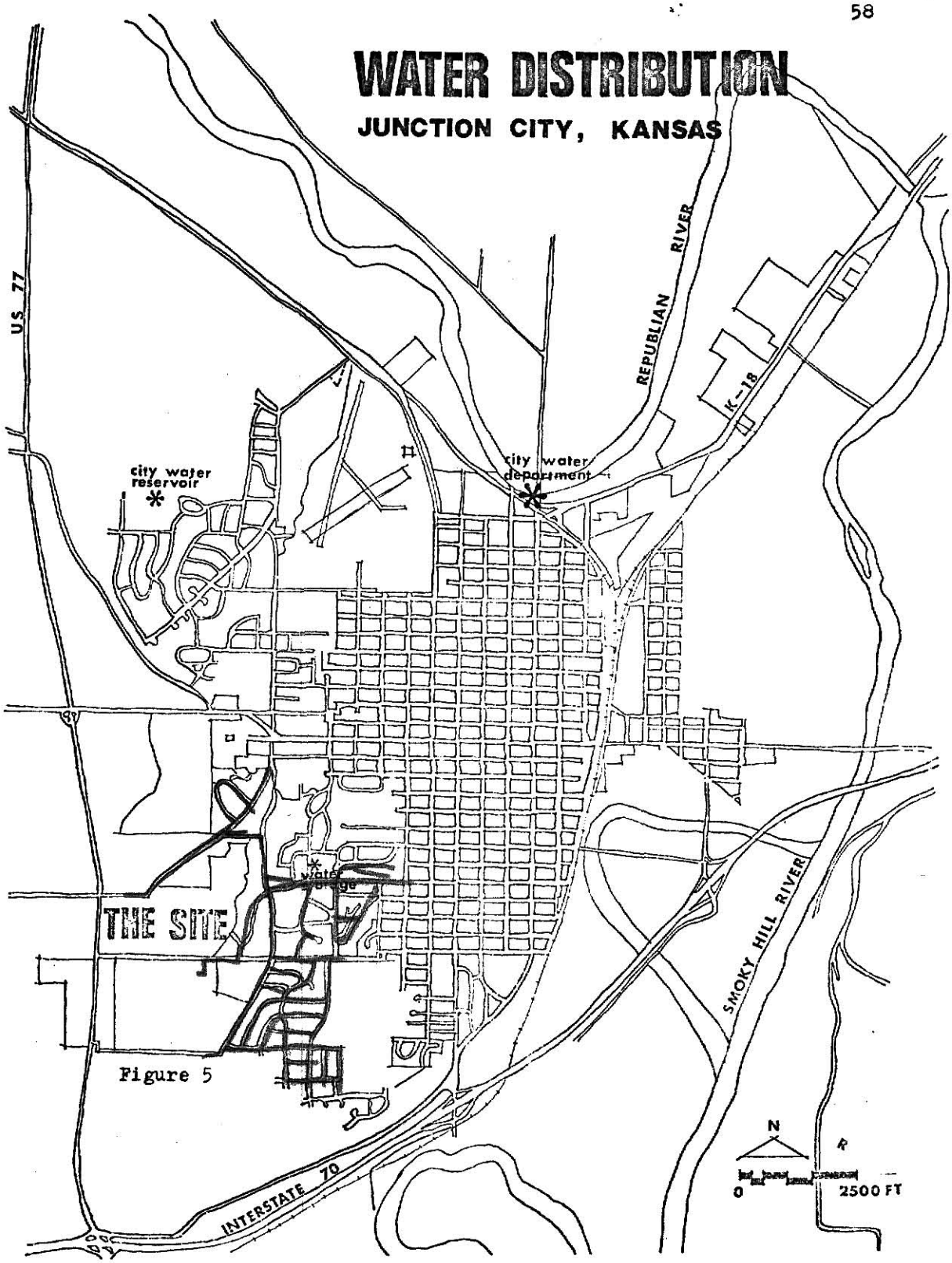
WATER DISTRIBUTION
JUNCTION CITY, KANSAS
US 77
REPUBLIAN RIVER
K-18
city water reservoir
city water department
water tower
THE SITE
SMOKY HILL RIVER
INTERSTATE 70
N
0
2500 FT

Figure 5

under the Ash Street ends at the edge of of the City. The elevation of the site is 1265 feet above the sea level on west side of the site, and then drops gently to the east as well as to the north and south. Existing sanitary sewer lines which are close to the site and lower than the site. Therefore, the proposed sanitary sewer on the site will be expected to work when are connected to the existing sanitary sewer. (Figure 6)

As to the connection of electricity and telephone to the site, they will be easy and cost less too because of the close relationship between the City and the site in terms of distance.

4. FACILITIES

a. PARKS AND RECREATIONAL AREAS

The site is surrounded by parks from all sides. On the east side of the site, a 20-acre Rimrock Lake Park with facilities of sidewalk, picnic table and pond is adjacent to the site. On the north side, a YMCA building,which has been built and offers some major indoor recreational facilities, is located just at the edge of the site. A little farther to the north, there is a private country club which provides a 9-hole golf course and other facilities. The access to the club is

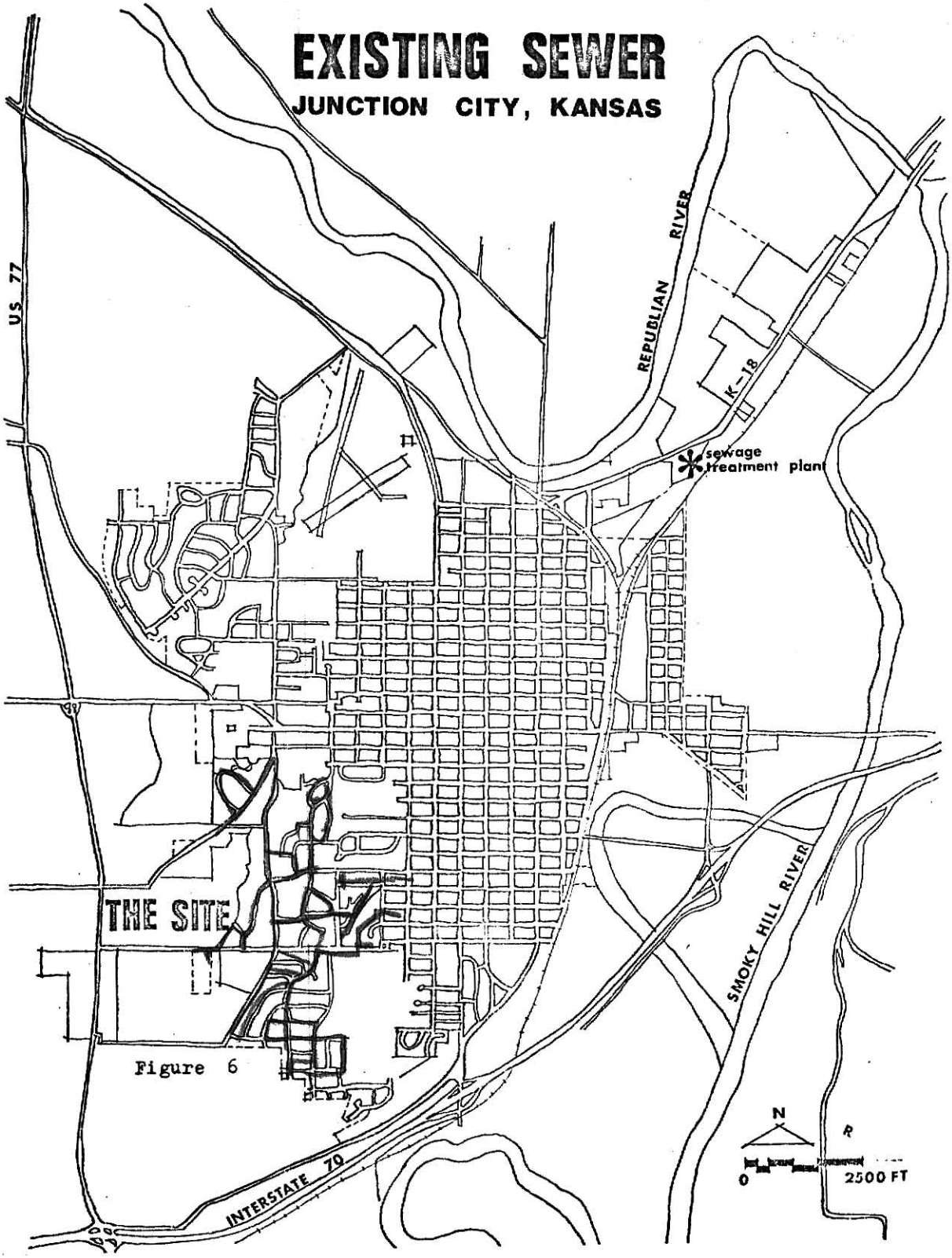
EXISTING SEWER
JUNCTION CITY, KANSAS
US 77
REPUBLIAN RIVER
K-18
sewage treatment plant
THE SITE
SMOKY HILL RIVER
INTERSTATE 70
N
R
0
2500 FT

Figure 6

convenient by taking U.S. 77, K-18 and Mcfarland Road from the site. To the northwest, Milford Lake is located four miles away from the site. Having 163 miles of shore line, it offers ideal hunting and fishing conditions and is the largest lake in Kansas. U.S. 77 provides the site with convenient access to the Lake. (Figure 7)

On the west side about 1½ miles away from the site, a public 9-hole golf course is located along Ash Street.

On the south side, a proposed 80-acre city park will be located right across Ash Street. After completion the park will include such facilities as softball field, tennis courts, playgound, rest room and so on, and will become a large city park in Junction City area.

Apart from these parks and recreational areas said above, such parks as Coronado City Park, City Park, etc.which are located within Junction City limits are all accessible from the site.

b.SCHOCLS

Currently, there are six elementary schools located in Junction City. Among them, Lincoln Grade School,located on the northeast side of the site, has a close relationship with the site in

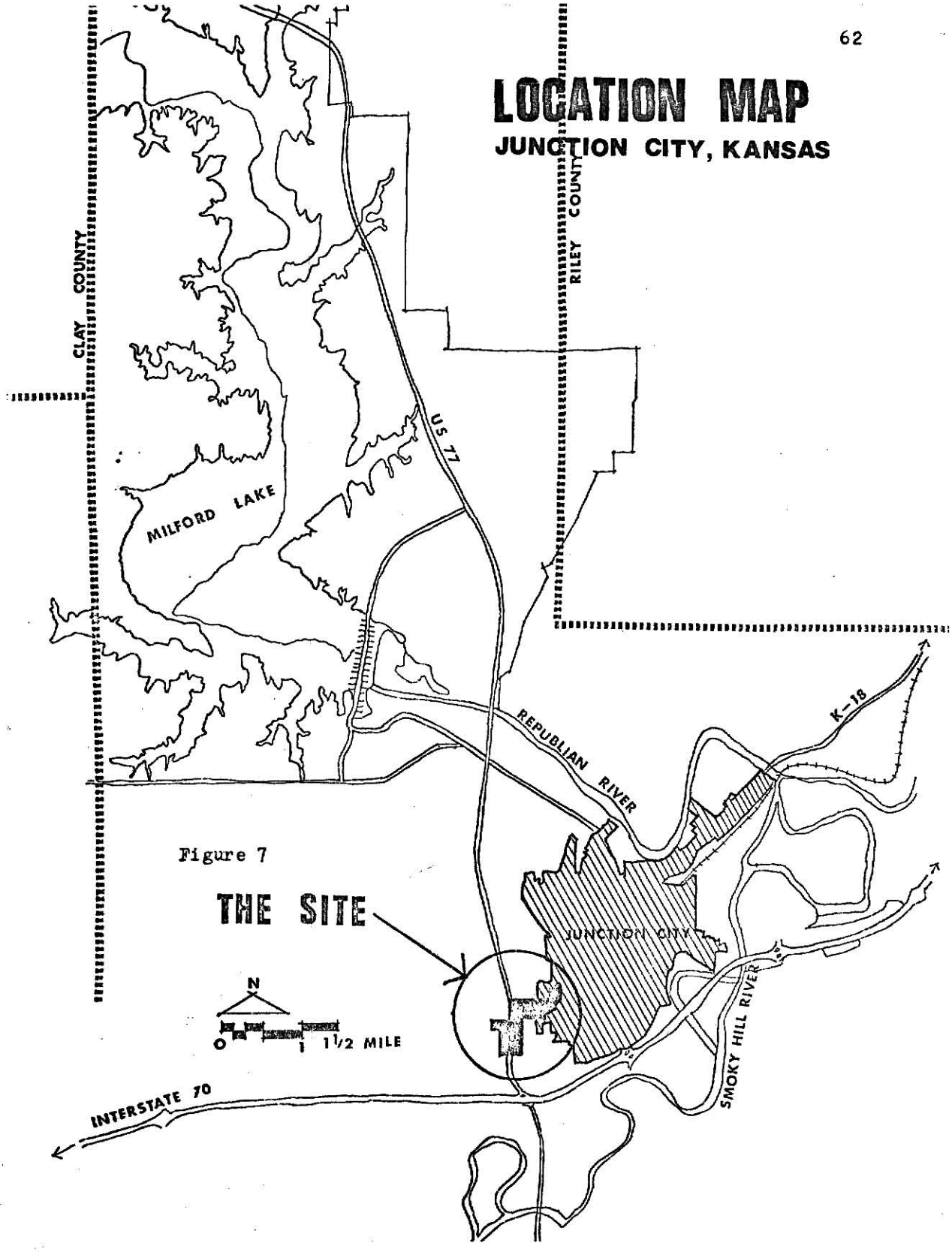
LOCATION MAP
JUNCTION CITY, KANSAS
CLAY COUNTY
RILEY COUNTY
US 77
MILFORD LAKE
REPUBLIAN RIVER
K-18
JUNCTION CITY
SMOKY HILL RIVER
INTERSTATE 70
THE SITE
N
0
1
1½ MILE

Figure 7

terms of distance and accessibility. The distance between the site and Lincoln Grade School is less then one mile, and the access to the school from the site is excellent by taking Eisenhower Drive, which passes the site.

Sheridan Elementary School is located on the east side of the site along the Ash Street. The distance between them is about three-fourth of a mile, which is considered to be a reasonable maxiumn for pupils walking to school.

Apart from these two grade schools, other grade schools of Franklin Grade School, The Catholic School, Westwood Elementary School, and Washington Grade School are all located farther than three-fourth of a mile from the site. Nevertheless, they are all accessible from the site by busing. (Figure 8)

This is one junior high school, and one senior high school within the City. The access to them is convenient too by taking the existing street system of the City.[16]

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[16] Ibid., p. 83

c. CHURCHS

Two churches, namely, First Church of Nazarene and Highland Bapist Church are located nearby.

First Church of Nazarene, located on the opposite side of the site along the Ash Street,is a new and large church. Highland Baptist Church is located 2,000 feet south of the site, and is presently in the process of physical expansion. (Figure 8)

Besides these ,Catholic and other kinds of churches are located farther from the site but within the boundaries of Junction City.

d.MEDICAL AND CIVIC

The Geary County Hospital is located at the corner of Ash Street and Eisenhower Drive, which is about 5 to 10 minutes of walking distance from the site. Valley View Professional Care Center, a nursing home for elders, is located on the opposite side of the site along the Ash Street and a small animal hospital which in under construction is located next to the Rimrock Lake Park, which is the natural boundary of the site on the east. (Figure 8)

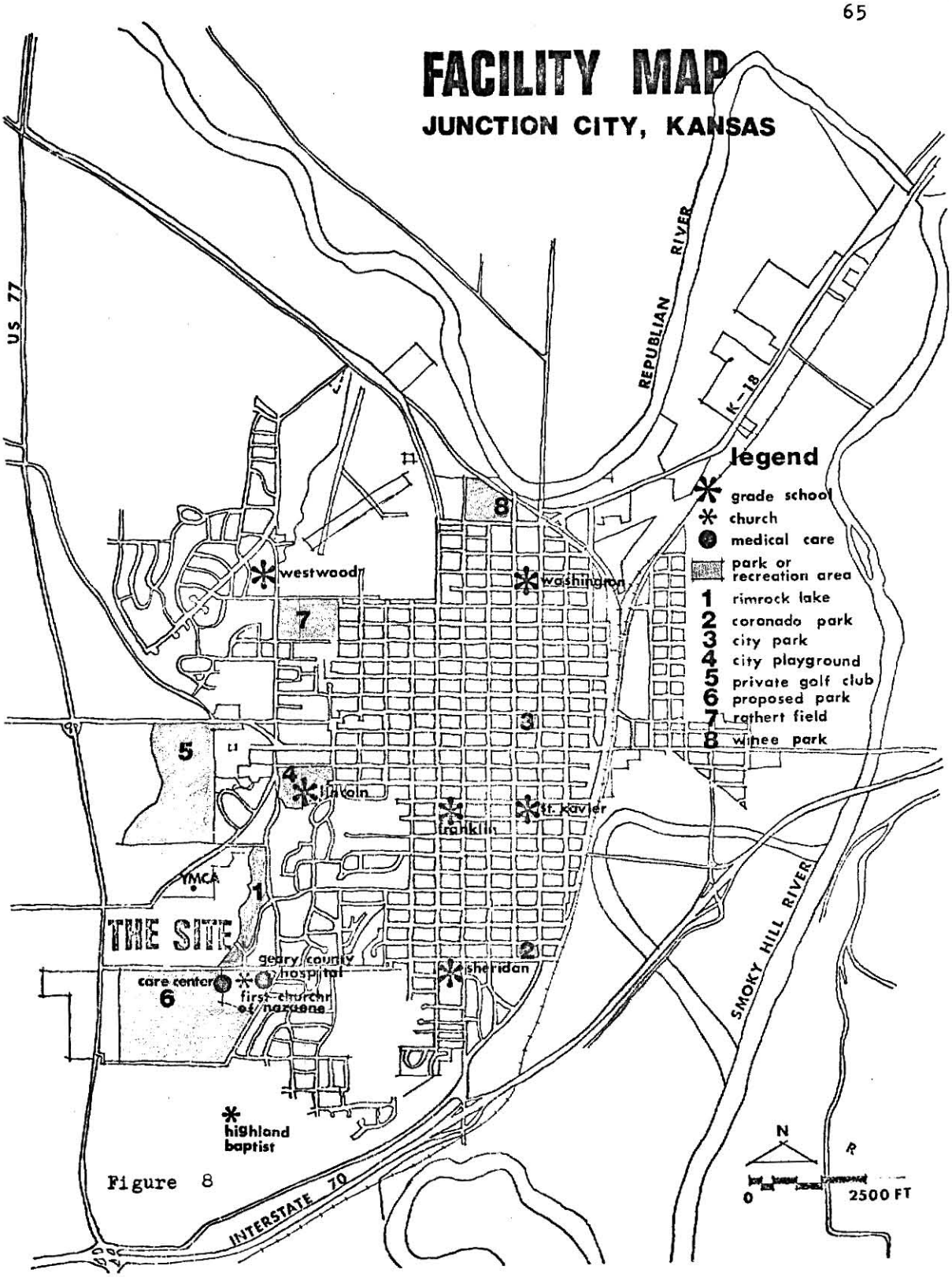
FACILITY MAP
JUNCTION CITY, KANSAS
US 77
REPUBLIAN RIVER
K-18
SMOKY HILL RIVER
INTERSTATE 70
legend
grade school
church
medical care
park or recreation area
1 rimrock lake
2 coronado park
3 city park
4 city playground
5 private golf club
6 proposed park
7 rothert field
8 wilhee park
westwood
washington
lincoln
franklin
st. xavier
sheridan
YMCA
THE SITE
geary county hospital
care center
6
first church of nazarene
highland baptist
N
0
2500 FT

Figure 8

The various functions of civic administration, such as City Hall, Fire Department, Post Office, and Library will be available to the site also.

C. THE CONDITION OF THE SURROUNDING ENVIRONMENT

1.CHARACTER OF THE ADJACNET LAND USES

The surrounding land use of a site expects a strong influence on future development of the site. Although changes and modifications of the land uses are possible, character of the adjacent land uses are still significant factors to the evaluation of a site.

There are no nearby industrical or major commercial activity uses. Residential and open land surround the site in a radius of one mile. The residential areas surrounding the site on the east are classified, according to the zoning of the City, as Suburban Residential and General Residential Districts, which are designed mainly for single-family dwellings. Recently, many new single families residences have been developed in these districts, and some new apartment complexes too.

The two-family and multi-family dwellings are

generally located in the older residential areas of the City and near the General Business District, which is two miles away from the site.

Open lands surround the site on the west, northwest, and southwest sides of the site and rolling away from it. (Figure 9)

2. OBJECTIONAL FEATURES

The objectional features mean hazards and undesirable environments, such as : smoke,noise, odors, flood, fire and explosion hazards, which are the major factors to influence the land value.

In Junction City, these hazarded and undesirable environments came mainly from industries, airport, Interstate Highway 70, sewerage treatment plant, railroad and Smoky Hill River :

a. Industrial areas occur east of the CBS and generally north of third street to about Grant Avenue.
b. The Junction City Municipal Airport is located at the north edge of the City.
c. Interstate Highway 70 passes by the City at the south edge and is about 4,000 feet from the site.
d. The sewerage treatment plant is located along K-18 at the northeast corner of the City.
e. Railroad tracks run through the east edge of the City and it's new station buildings are

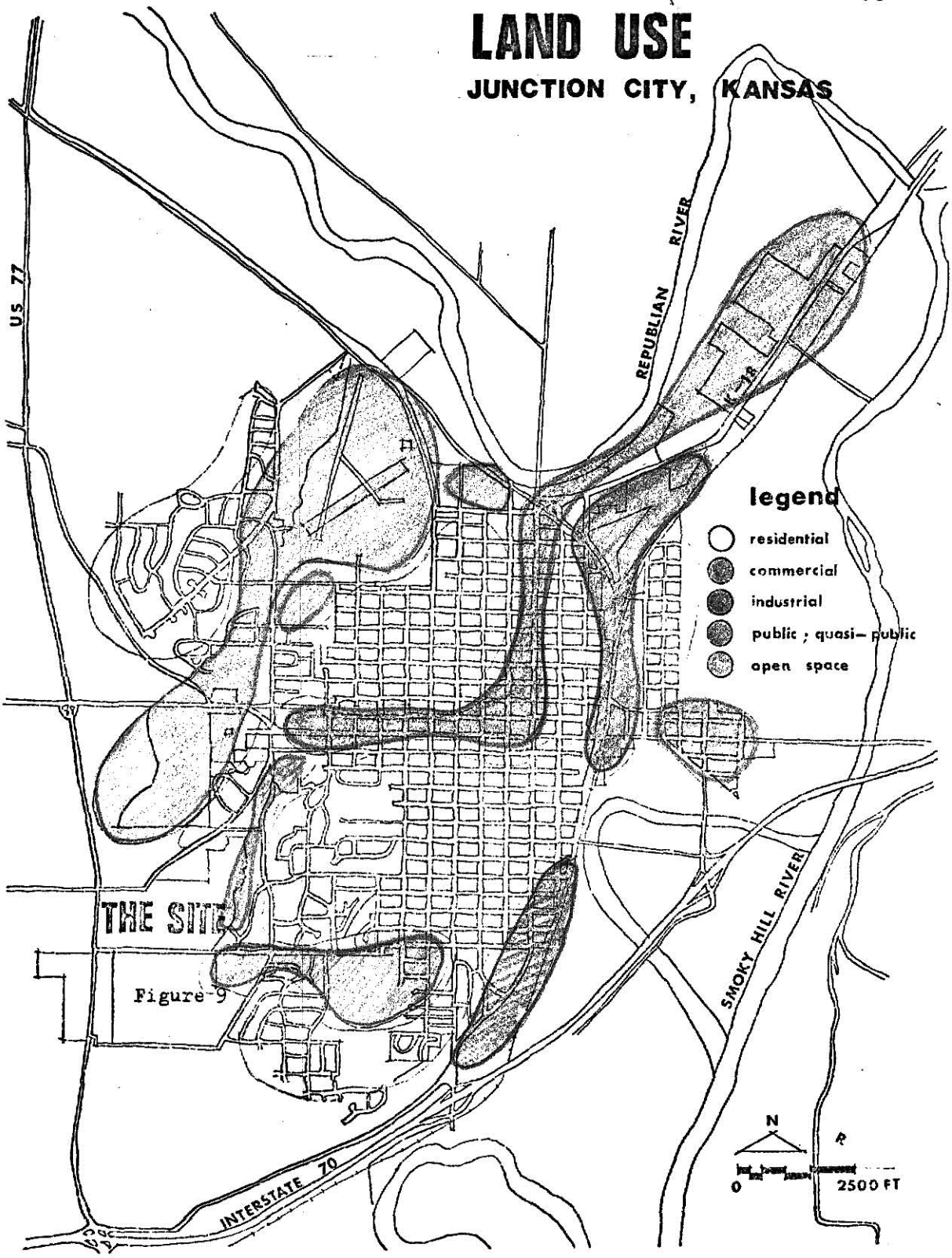
LAND USE
JUNCTION CITY, KANSAS
US 77
REPUBLIAN RIVER
K-18
legend
residential
commercial
industrial
public ; quasi- public
open space
THE SITE
SMOKY HILL RIVER
INTERSTATE 70
N
0
2500 FT

Figure 9

located farther northeast.

f. The Smoky Hill River is located east of the City and the low land between the river and Washington Street is flood plain.

In summary, the south, north, east and northeast edge of Junction City are the areas where hazards and undesirable environments exist. The study site is located toward the southwest of the City and far from the hazard producing areas, so little influences will be felt in the area.

D. THE CONTROL OF PUD

A PUD cannot just happen. In order to fulfill the objective of its creation there must be control and discipline all the way.

One of the first factors to be considered in creating and developing a PUD is the zoning code applicable to the land that is used. Since the PUD is a relatively new approach to housing, local housing codes may not be designed to handle it expeditiously, despite the fact that municipal and county officials are usually quick and eager to see and accept the desirability

of a well-designed PUD proposal. The street-and-lot approach of the usual standards is frequently incompatible with the basic approach of a PUD, and in some cases, it is even as a limited measure of the suitability of the PUD proposed design.

Such difficulties in application of local zoning structures can be eliminated by a planned-unit provision in the local regulations and ordinances. It outlines the locality's procedure for analyzing planned-unit proposals. When the proposal complies with the locality's PUD requirements, a PUD then can happen.

Happily, Junction City has added such planned-unit provisions to its regulation in Article 10 section — Planned Development Districts. The major provision is as follows :

" The City Governing Body may, by ordinance, approve the establishment of a planned development district or any parcel or tract of the land which is suitable for and of sufficient size to be planned and developed or redeveloped, as a unit and in a manner condistent with the intent and propose of these regulations with the comprehensive plan."

E. THE OWNERSHIP OF THE LAND

The land for development is owned by one person, whose name is Gerald Ervin, an architect and contractor of Junction City.

This one-owner characteristic of the land will make the PUD easy to control in the process of planning and easy to maintain and management after the construction too.

CHAPTER III. SITE ANALYSIS

The purpose of the site analysis is to understand the personality of the site, to value the suitability for development of the site and to establish a guideline for later development.

A. SOILS

The primary objective of the soil analysis is to evaluate the suitability of each soil type of the site for supporting development.

The soil types on the site for study, according to the Unified Soil Classification System, are classified as Cc,Cd,Cf,Fb,Ga,Id, Sd,Se,Sf,Sg,Wb,Wc, and Wd.

a. Cc (Crete silty clay loam)

This type of soil occurs on 0 to 1 percent slopes, mostly center areas of the site. The surface soil is dark grayish-brown silty clay loam, the subsoil is brown very firm silty clay. The soil has slow runoff and is slowly permeable in the subsoil.

b. Cd (Crete silty clay loam)

This type of soil occurs on 1 to 4 percent slopes. The darkened surface layer is 10 to 14 inches thick. The subsoil generally is

slightly browner and contains a little less clay than that of Cc. The runoffis medium, and permeability is slow.

Cf.(Crete soil,severely eroded)

This unit occurs on slopes of 2 to 8 percent. surface soil has been mostly removed by erosion , and the lighter colored clay subsoil is exposed.

Fb.(Farnum fine sandy loam)

This type of soil occurs on slopes of 1 to 4 percent. The surface soil is fine sandy loam, and the subsoil is very firm clay.

Ga.(Geary silt loam)

The surface of this soil is silt loam and the subsoil is firm silty clay loam.

Id.(Irwin soils)

The surface is very dark grayish-brown silty clay loam. The subsoil is dark grayish-brown very firm clay.

Sd.(Shellabarger sandy loam)

This type of soil occurs on 4 to 8 percent slopes. The surface is sandy loam, and the subsoil is friable sandy clay loam.

Se. (Shellabarger sandy loam)

This kind of soil occurs on the slopes of 8 to 20 percent, and along the streams.

Sf.(Sogn rocky clay loam)

This is a dark colored, clayey soil that is only 10 inches deep over limestone. The slopes range up to 8 percent.

Sg.(Sogn complex)

The Sogn complex is a complex in every respect; a complex of soil, slopes, and range sites.

Wb.Wc.Wd.(Hastings silty clay loam)

These types of soil occur on the slopes of 1 to 4 percent, 4 to 8 percent and 8 to 12 percent respectively. The surface is dark grayish-brown silty clay loam, and the subsoil is brown firm clay loam.[17]

The results of the soil analysis are shown on the Soil Map, which not only illustrates the location of each type of soil on the site, but also evaluates the condition of soils in terms of suitability for development.

The key for this evaluation is as follows:

WHITE --- Area which is classified "good" for development.

LIGHT --- Area which is classified"fair" for development

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17 Soil Survey Geary County,Kansas. United States Department of Agriculture, Soil Conservation Service,1975,pp. 17-28

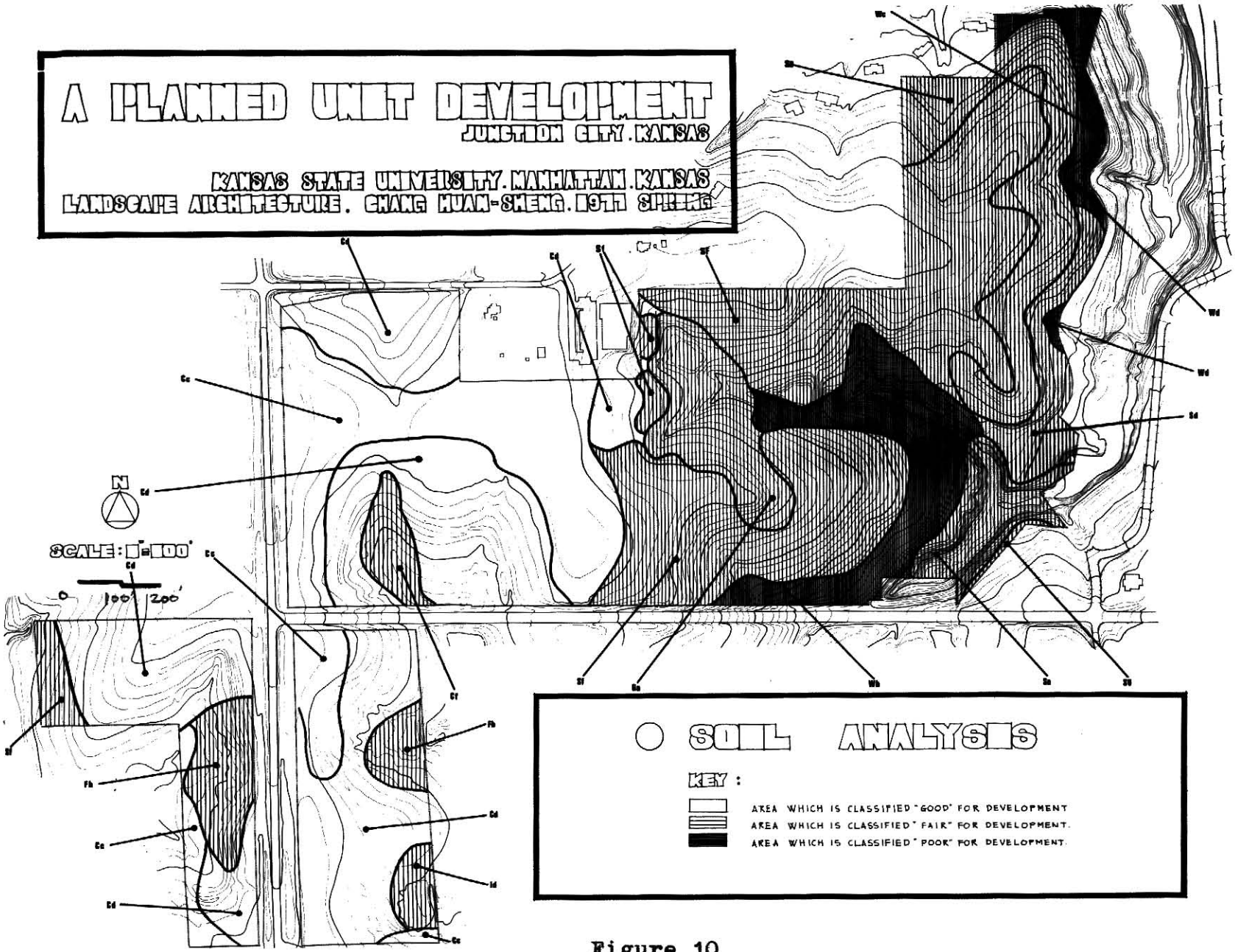

A PLANNED UNIT DEVELOPMENT
JUNCTION CITY . KANSAS
KANSAS STATE UNIVERSITY . MANHATTAN . KANSAS
LANDSCAPE ARCHITECTURE . CHANG HUAN-SHENG . 1977 SPRING
N
SCALE: 1" = 100'
0
100'
200'
SOIL ANALYSIS
KEY :
AREA WHICH IS CLASSIFIED "GOOD" FOR DEVELOPMENT
AREA WHICH IS CLASSIFIED "FAIR" FOR DEVELOPMENT.
AREA WHICH IS CLASSIFIED "POOR" FOR DEVELOPMENT.

Figure 10

MEDIUM--- Area which is classified " poor " for development.

B. SLOPE ANALYSIS

The primary objective of the slope analysis is to understand the over-all pattern of the slopes on the site, which will be helpful in determining the best land uses for various portions of the site, along with feasibility of construction.

The breakdown of grades here would be 0-5, 5-10, 10-20, and 20 +. By using the formuls of $D = \frac{\text{contour interval}}{\text{\% grade}} \times 100.$

Then, distance between two contours (D) at 5 % will be 40 feet at contour interval of two feet, at 10 % will be 20 feet, and at 20 % 10 feet. Using the distance of 10,20, and 40 feet as a guide, thus the slope at the set breakdown of grades emerges.

The key for the slope analysis which is illustrated graphically on the Slope Analysis Map is :

WHITE ---Area which is 0-5 % slope and classified " best " for development.

LIGHT --- Area which is 5 - 10 % slope and classified "good" for development.

MEDIUM --- Area which is 10 to 20 % and classifed " Fair" for development.

DARK --- Area which is over 20 % and classified "poor" for development.

C. HYDROGRAPHY

The hydrography analysis is to study what existing patterns of runoff affect the site, locate the high points, the ridges, valleys, streams, swales, etc.. This will show where water will be coming from, which areas will be drained, and how they will affect the planning of the site.

On the site, there is a stream running from northwest to southeast, which collects most of the rainfall, conducting it, and then disposing of it into the Rimrock Lake. In addition to this, a few swales within the site collect water and discharge it off the site.

The high point of the site is located at the west edge,and the elevation of it is 1,265 feet above the sea level. The low point is located at the east edge, adjacent to Rimrock Lake ,and the elevation of it is 1,169 feet.

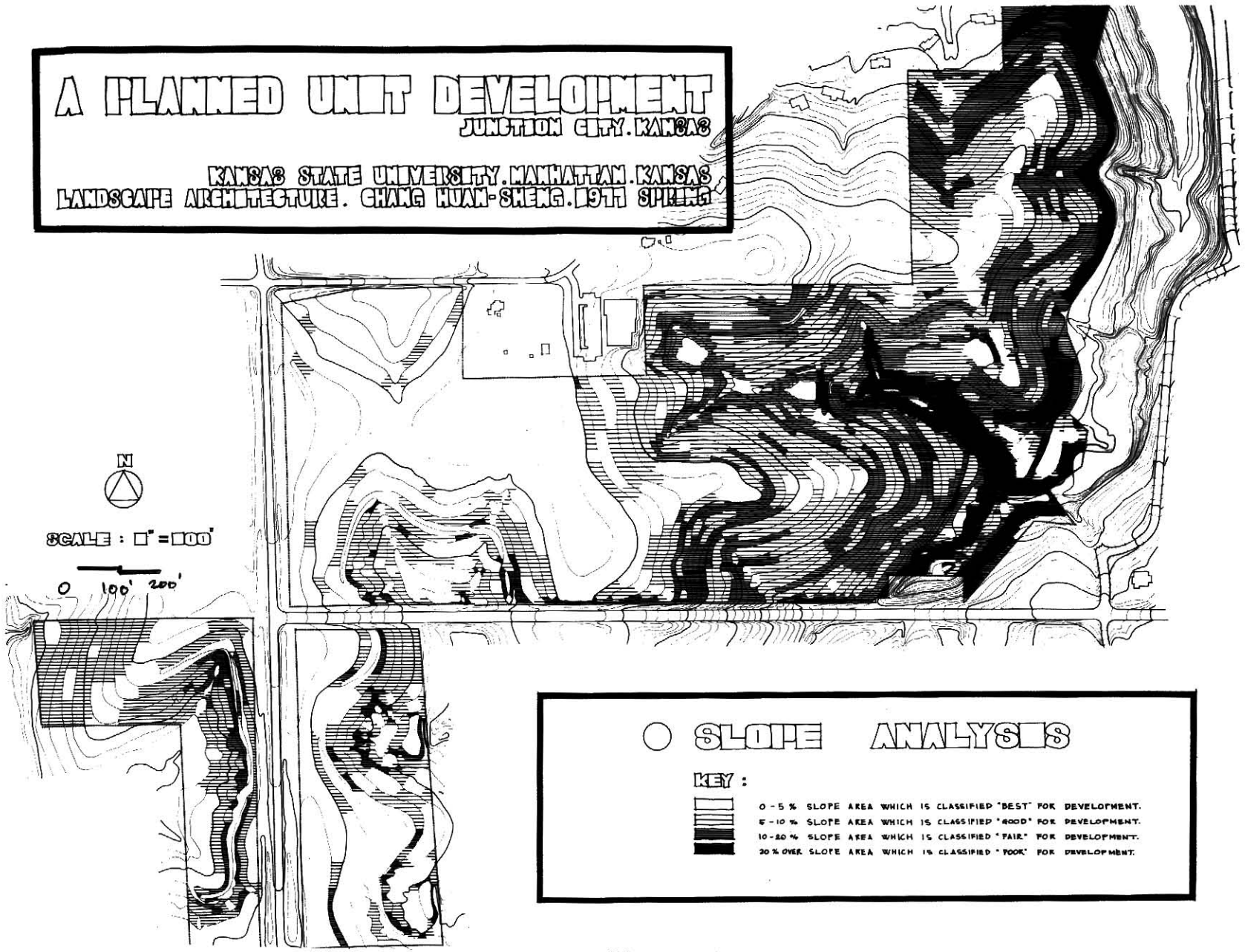

A PLANNED UNIT DEVELOPMENT
JUNCTION CITY. KANSAS
KANSAS STATE UNIVERSITY. MANHATTAN. KANSAS
LANDSCAPE ARCHITECTURE. CHANG HUAN-SHENG. 1971 SPRING
N
SCALE : 1" = 100'
0 100' 200'
SLOPE ANALYSIS
KEY :
0 - 5 % SLOPE AREA WHICH IS CLASSIFIED "BEST" FOR DEVELOPMENT.
5 - 10 % SLOPE AREA WHICH IS CLASSIFIED "GOOD" FOR DEVELOPMENT.
10 - 20 % SLOPE AREA WHICH IS CLASSIFIED "FAIR." FOR DEVELOPMENT.
20 % OVER SLOPE AREA WHICH IS CLASSIFIED "POOR." FOR DEVELOPMENT.

Figure 11

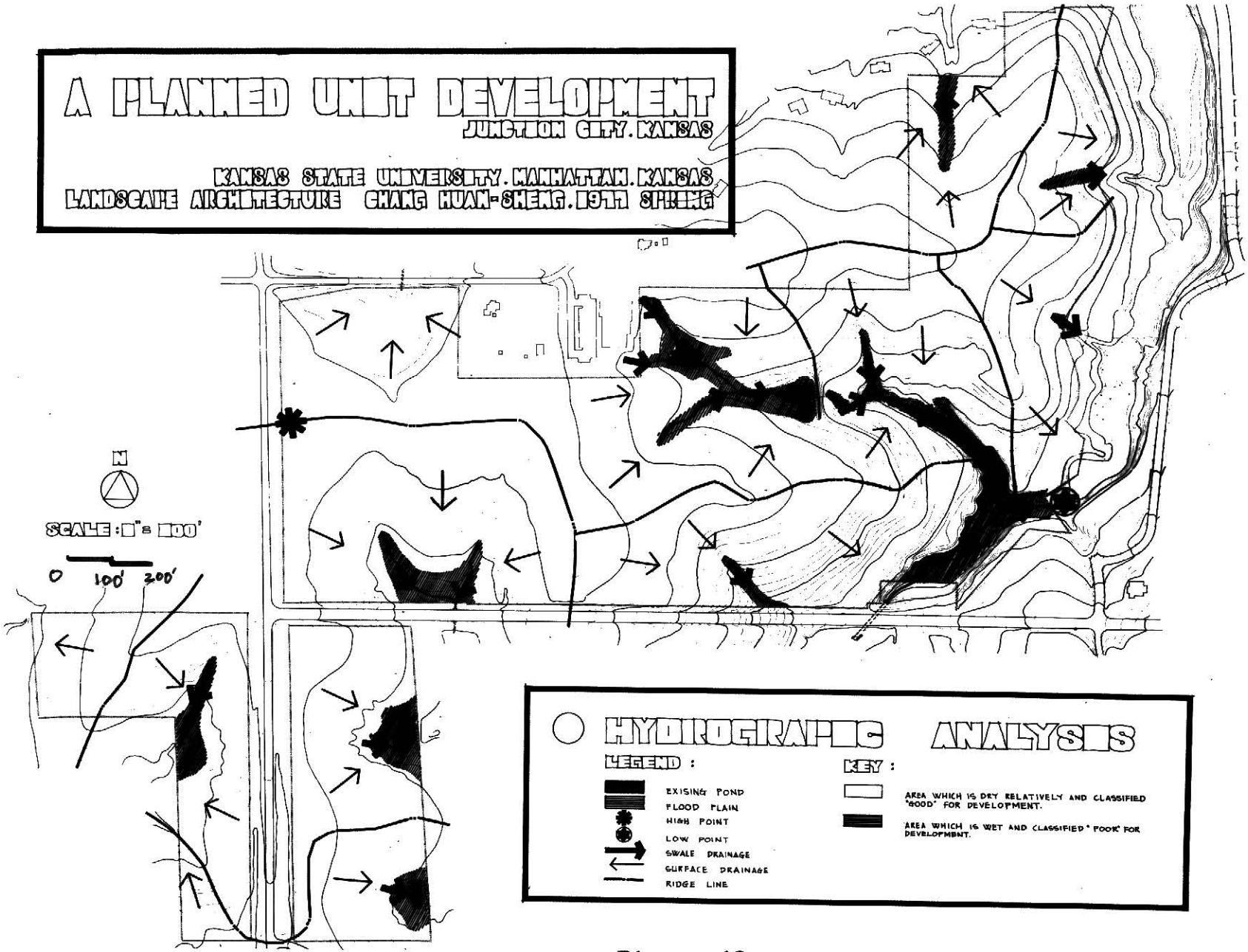

A PLANNED UNIT DEVELOPMENT
JUNCTION CITY, KANSAS
KANSAS STATE UNIVERSITY, MANHATTAN, KANSAS
LANDSCAPE ARCHITECTURE CHANG HUAN-SHENG, 1977 SPRING
N
SCALE: 1" = 100'
0 100' 200'
HYDROGRAPHIC ANALYSIS
LEGEND :
EXISING POND
FLOOD PLAIN
HIGH POINT
LOW POINT
SWALE DRAINAGE
SURFACE DRAINAGE
RIDGE LINE
KEY :
AREA WHICH IS DRY RELATIVELY AND CLASSIFIED "GOOD" FOR DEVELOPMENT.
AREA WHICH IS WET AND CLASSIFIED "POOR" FOR DEVELOPMENT.

Figure 12

The hydrographic features are shown in the Hydrography Map. The key for this analysis is :

WHITE--- Area which is dry relatively and classified " good " for development.

DARK --- Area which is wet most the time, such as stream, swales, valleys, and etc. It is classified " poor " for development.

D. VEGETATION

The primary objectives of this analysis are to preserve the large existing trees and heavily wooded areas, and to make use of them in the site planning for wind protection, shade, buffer zones or screens.

In the site, there are two major heavily wooded areas, which are respectively located along the stream valley, and on the bank of Rimrock Lake Park. A group of large trees for wind protection starts from YMCA at the north, then runs south,and stops where it meets Ash Street.

Apart from these three wooded areas, a lot of small evergreen trees grow within the site too.

The location of these wooded areas and trees are indicated on the Vegetation Map.

The key for this Vegetation Map and analysis is :

WHITE --- Area which is no vegetation and classified " Good " for development.

LIGHT --- Area which is covered with minor trees or shrubs and classified " fair " for development.

MEDIUM --- Area which is covered with heavy wood and to be preserved. The classification for this area is " poor " in terms of development.

E. CLIMATOLOGY

Climate has a basic influence on site planning : the location and orientation of structures, the equipment for cooling or heating, the fenestration, the materials and the planting in general.

The climate of the site ,Junction City, Kansas, can be best described as continental . Summers are long,dry,and hot. Spring is usually cool with frequent periods of rain.Autumn has only occasional periods of rain and otherwise is long,with mild temperatures. Winter is cold with a mean temperature of 32.6°.

The average annual rainfall is about 33 inches, and the snowfall in winter is about 4 inches.

Prevailing winds shift from a southerly direction in the spring through early fall to northwestly in the remaining months..

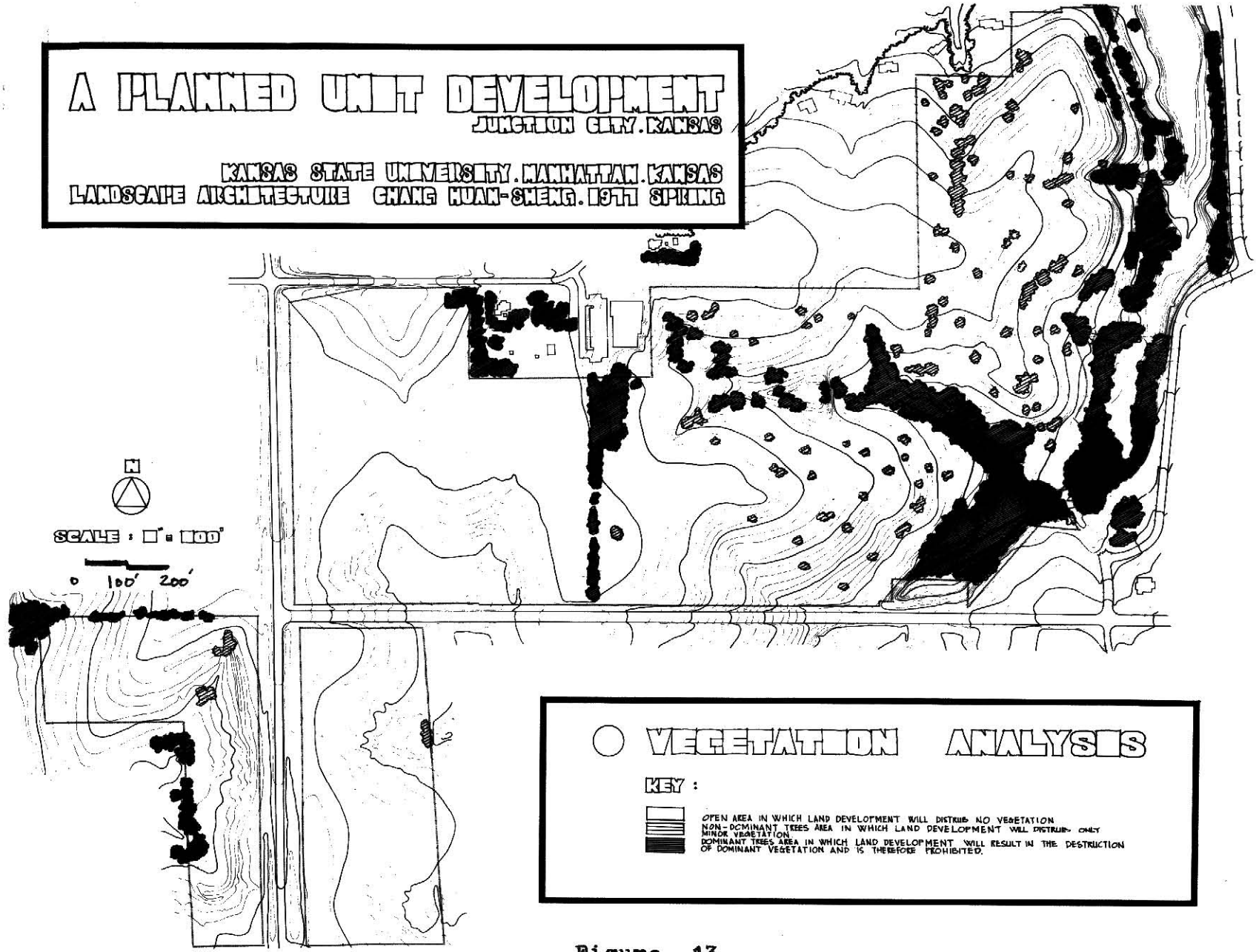

A PLANNED UNIT DEVELOPMENT
JUNCTION CITY. KANSAS
KANSAS STATE UNIVERSITY. MANHATTAN. KANSAS
LANDSCAPE ARCHITECTURE CHANG HUAN-SHENG. 1977 SPRING
N
SCALE : 1" = 100'
0 100' 200'
VEGETATION ANALYSIS
KEY :
OPEN AREA IN WHICH LAND DEVELOPMENT WILL DISTRUB NO VEGETATION
NON-DOMINANT TREES AREA IN WHICH LAND DEVELOPMENT WILL DISTRUB ONLY MINOR VEGETATION
DOMINANT TREES AREA IN WHICH LAND DEVELOPMENT WILL RESULT IN THE DESTRUCTION OF DOMINANT VEGETATION AND IS THEREFORE PROHIBITED.

Figure 13

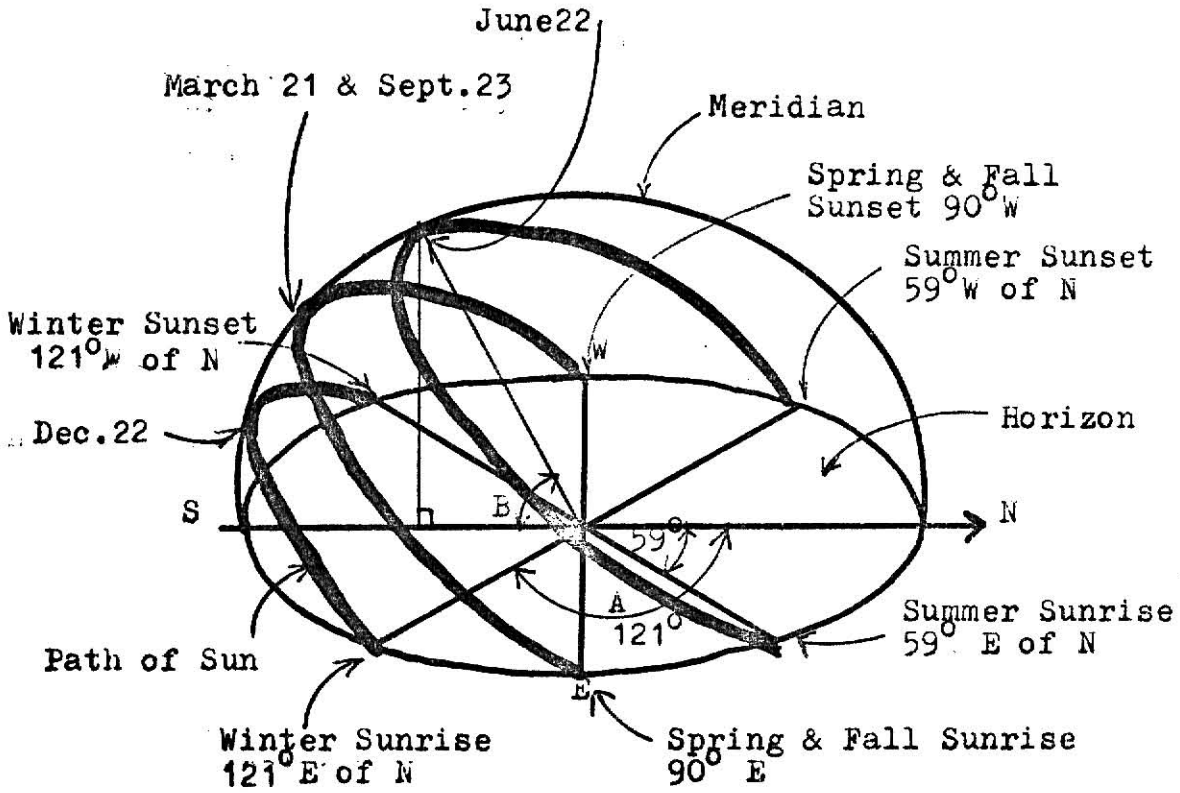
Climatic conditions for the site and Junction City area have been summarized below.

1. SUN (40° North Latitude)

a. SUNRISE AND SUNSET

	Winter Dec.22	Fall Sept.23	Spring March21	Summer June 22
Sunrise	7:30	6:00	6:00	4:30
Sunset	4:30	6:00	6:00	7:30

b. SOLAR ANGLES (Figure 14)



Angle " A"= Azimth
Angle "B "= Altitude

	Summer		Winter		Spring & Fall	
	Sunrise	Sunset	Sunrise	Sunset	Sunrise	Sunset
Azimuth	59°	59°	121°	121°	90°	90°
	Noon		Noon		Noon	
Altitude	73° 30'		50°		26° 30'	

2. PREVAILING WINDS

	Years of record	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Topeka	59	NW	N	N	S	S	S	S	S	S	S	S	S
Wichita	57	N	N	S	S	S	S	S	S	S	S	S	S

Based on records through 1945

3. PRECIPITATION (Monthly mean total precipitation - inches)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
0.9	1.0	1.9	2.9	5.4	4.9	3.9	3.7	3.7	2.5	1.4	1.0	33

Source : State Climatologist

4. TEMPERTURE (Monthly mean temperture - F^{o})

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
29.9	34.4	43.5	56	64.9	74.9	78.6	79.6	71.0	59.6	43.8	33.5	55.8

Source : State Climatologist

5. HUMIDITY (Mean relative humidity - %)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
72	73	69	63	69	72	69	64	66	66	69	72	68

Source : State Climatologist

On the Climate Analysis Map, 3 different areas are shown. The Key for this :

WHITE --- Area which is warm slope and classified " good " for housing.

LIGHT --- Area which is cool slope and classified " Fair " for housing.

DARK ---- Area which is cold and classified " Poor" for housing.

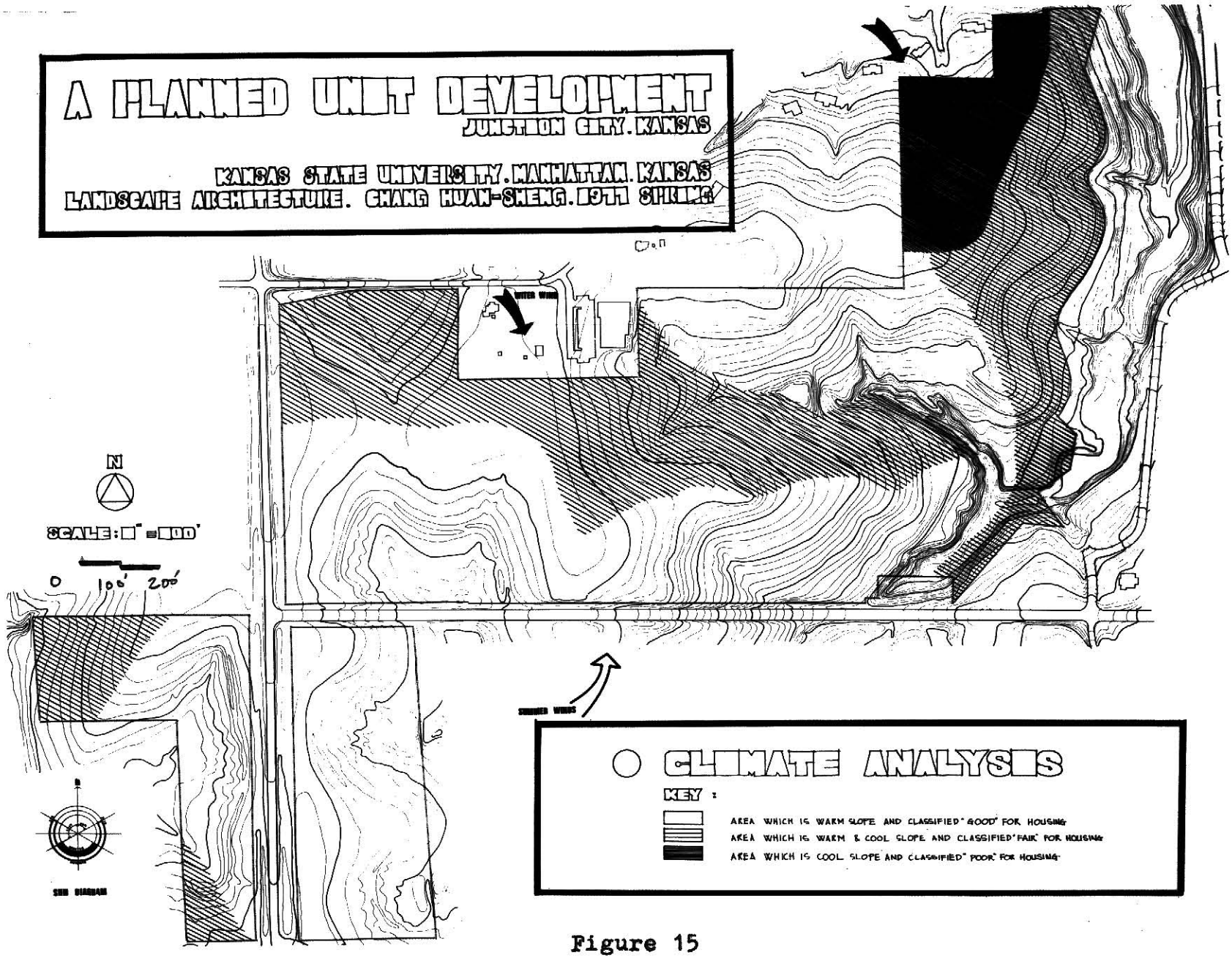

A PLANNED UNIT DEVELOPMENT
JUNCTION CITY, KANSAS
KANSAS STATE UNIVERSITY, MANHATTAN, KANSAS
LANDSCAPE ARCHITECTURE, CHANG HUAN-SHENG, 1971 SPRING
N
SCALE: 1" = 100'
0 100' 200'
CLIMATE ANALYSIS
KEY :
AREA WHICH IS WARM SLOPE AND CLASSIFIED "GOOD" FOR HOUSING
AREA WHICH IS WARM & COOL SLOPE AND CLASSIFIED "FAIR" FOR HOUSING
AREA WHICH IS COOL SLOPE AND CLASSIFIED "POOR" FOR HOUSING

Figure 15

F. AESTHETIC VALUES

The Primary objectives of this analysis are to determine significant natural features of earth, rock, water, or plant materials on the site and then to preserve them in the later site development.

A stream, associated with ponds and heavy woods, is the outstanding scenic beauty on the site, and Rimrock Lake Park, which is adjacent to the site, is the most beautiful area off the site.

The views on the site to the surrounding areas are all good. There are no objectional visual elements around at all.

On the Aesthic Values Map, there are three kinds of areas valued by their aesthetic qualities. The keys of this valuation presentation are :

WHITE ---Area which is low in aesthetic value of landscape and is classified " good " for development.

LIGHT --- Area which is high in aesthetic value of landscape and is classified " fair " for development.

DARK ----Area which has outstanding natural

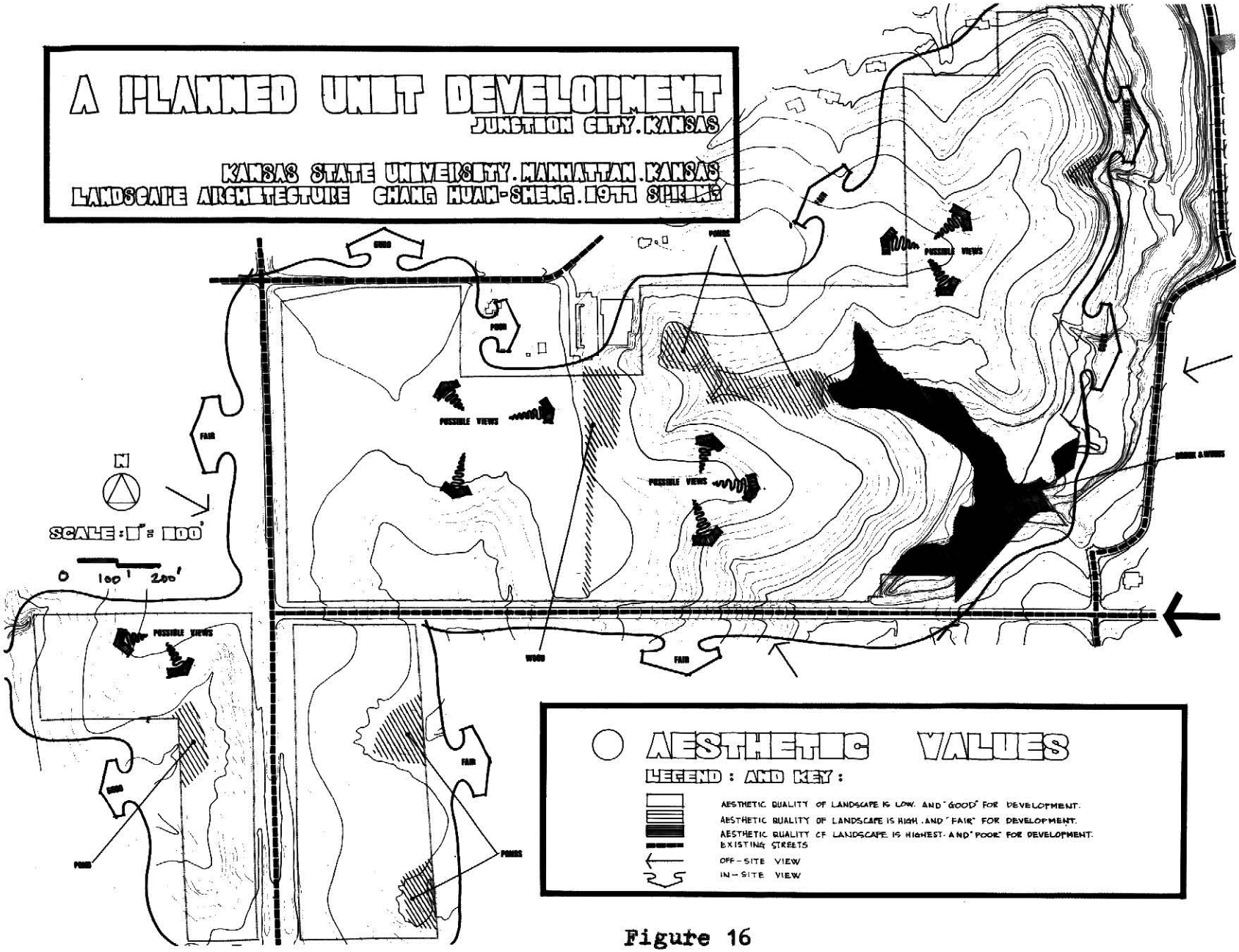

A PLANNED UNIT DEVELOPMENT
JUNCTION CITY, KANSAS
KANSAS STATE UNIVERSITY, MANHATTAN, KANSAS
LANDSCAPE ARCHITECTURE CHANG HUAN-SHENG, 1971 SPRING
N
SCALE: 1" = 100'
0 100' 200'
POOR
FAIR
WOOD
POWER
POSSIBLE VIEWS
AESTHETIC VALUES
LEGEND AND KEY:
AESTHETIC QUALITY OF LANDSCAPE IS LOW, AND "GOOD" FOR DEVELOPMENT.
AESTHETIC QUALITY OF LANDSCAPE IS HIGH, AND "FAIR" FOR DEVELOPMENT.
AESTHETIC QUALITY OF LANDSCAPE IS HIGHEST, AND "POOR" FOR DEVELOPMENT.
EXISTING STREETS
OFF-SITE VIEW
IN-SITE VIEW

Figure 16

beauty and is classified " poor " for development, but is " excellent " for preservation.

G. COMPOSITE MAP

This map is the result of all analysis in a graphical way. It shows all of the development values superimposed upon each other. The lightest areas are locations with the most potential for development. The darkest areas are locations which are least capable of development.

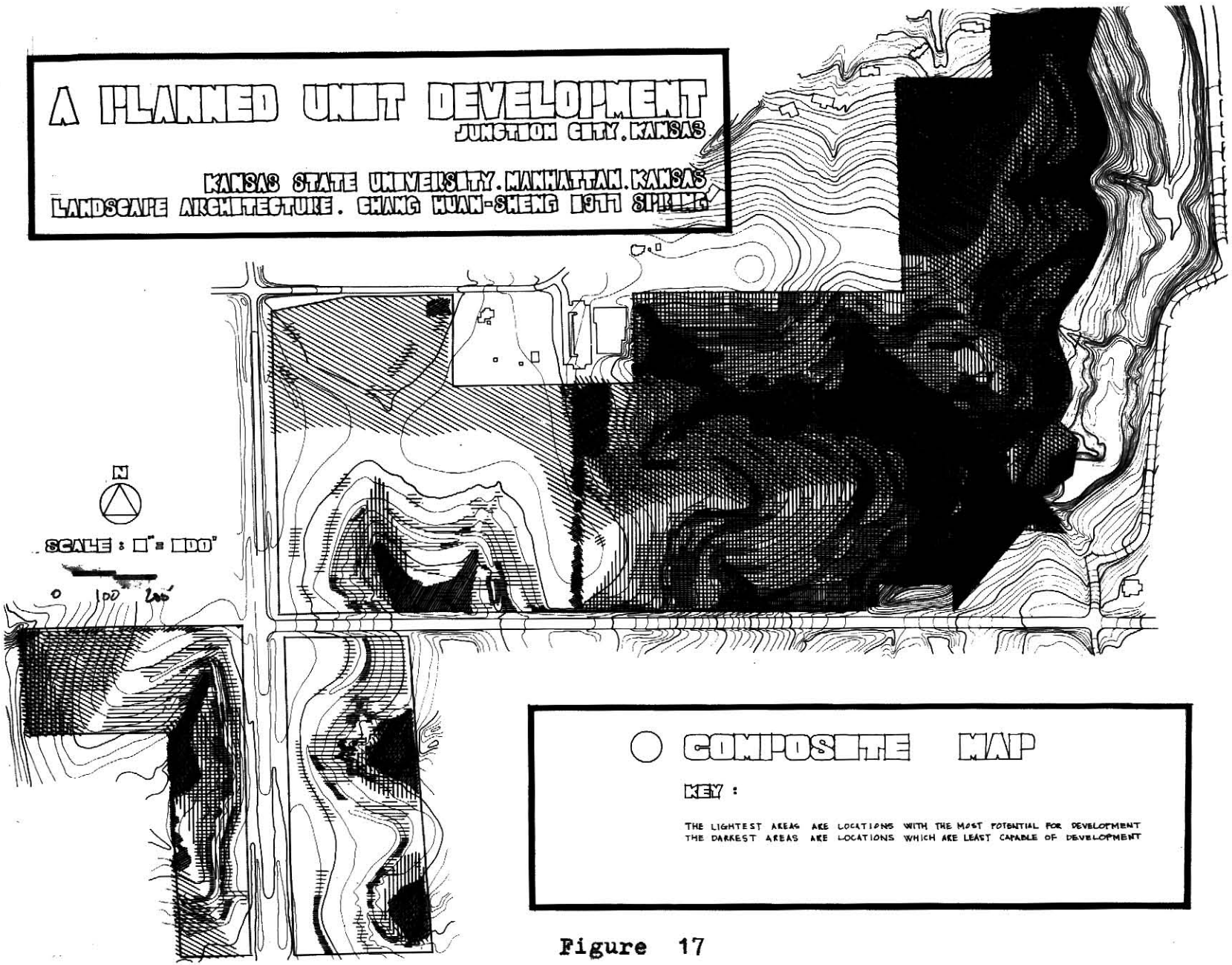

A PLANNED UNIT DEVELOPMENT
JUNCTION CITY, KANSAS
KANSAS STATE UNIVERSITY, MANHATTAN, KANSAS
LANDSCAPE ARCHITECTURE. CHANG HUAN-SHENG 19TH SPRING
N
SCALE : 1" = 100'
0 100 200'
COMPOSITE MAP
KEY :
THE LIGHTEST AREAS ARE LOCATIONS WITH THE MOST POTENTIAL FOR DEVELOPMENT
THE DARKEST AREAS ARE LOCATIONS WHICH ARE LEAST CAPABLE OF DEVELOPMENT

Figure 17

Part III.

The Planning of the Site

CHAPTER I. LAND USE ANALYSIS

Once the site has been analyzed, the planning of the site begins with a land use analysis, which is an important element of the PUD development plan.

Land use analysis is basically concerned with the decision on the types of use and linkages between uses whcih will be located on the site.

A.TYPES OF USE

1. MARKET ANALYSIS FOR HOUSING AND RESIDENTIAL USE

The purpose of this analysis is to provide assistance and guideance in the matter of prospective quantitative and qualitative demand for housing in the site.

a. FACTORS IN CURRENT HOUSING DEMANDS

There are several factors which influence the housing demand. Of all factors the household, family income, and employment trends are the most important units to consider in housing demand. The employment trend in the principal determinant of population growth; population is translated into households; households are the units of demand for housing. And family income controls the capacity of household to pay the price (or rent) of future housing.

(i). Households

Households are variously constituted. Some are identical with families; others are composed of a single individual or a group of unrelated individuals; and still others are a combination of families or of a family and individuals. Regardless of its composition, the household, rather than the family, is the unit of demand for housing. Thus, the analysis of households is the crux of the demographic analysis, which is needed in analysis of housing demand.

Primary emphasis in the analysis of households is placed on the trends of growth. Essentially, the analysis is concerned with household formation, i.e., the rate of household growth during specific periods in the past and the expected rate of growth during the forecast period covered by the market study. Household size plays a vital role in this analysis as a determinant of the estimated current and projected number of households.

Table 5 shows household size trends in Junction City from 1950 to 1970. According to

HOUSEHOLD SIZE TRENDS, JUNCTION CITY, GEARY COUNTY, 1950 - 1970.

Household Size			1 - 2 Persons	3 - 4 Persons	5 or more Persons	Total
Households		1950	1,913	1,917	575	4,405
		1960	2,603	2,269	1,131	6,003
		1970	3,589	2,183	856	6,628
Change	1950 to 1960	Number	+ 690	+ 352	+ 556	+1,598
		Percent	+ 36.1	+ 18.4	+ 96.7	+151.2
	1960 to 1970	Number	+ 986	- 86	- 275	+ 625
		Percent	+ 38.9	- 3.8	- 24.3	+ 10.8
Percent Distribution		1950	43.4	43.5	13.1	100.0
		1960	43.4	37.8	18.8	100.0
		1970	54.1	32.9	12.9	100.0

Source : U.S. Census of Housing, 1970.

TABLE 5

the U.S. Census of Housing, one to two person households increased by nearly 40 percent and comprised 986 households of the total housing stock. Whereas three to four person households and those of five or more persons had shown an increase of 18.4 percent and 96.7 percent respectively from 1950 to 1960, they both registered decreases in the 1960 - 1970 decade of 3.8 and 24.3 percent respectively. This analysis indicates that there is a trend in Junction City toward smaller family households.

(ii). Family Income

Ability and willingness to pay for housing distinguish the effective demand from the sheer need or desire for housing. The measurement of the financial capacity of potential buyers and renters of new dwelling units is, therefore, a critical element in the analysis of local housing markets.

In housing market analysis, the primary concern, with respect to income, is its distribution among the population. The

number and proportion of the population receiving income in specific size classes is much more significiant than income data in any other form.

According to the Consumer Price Index for 1969, the median family income of both Junction City and Geary County have been consistently less by approximately $ 1,000 than the State median family income since 1949. Table 6 shows family income distribution for the City, County, and State of Kansas as recorded in the 1970 U.S. Census of population. In 1970, Junction City median family income was $ 1,818 less than that of the State, and Geary County median family income was $ 1,556 less than the State. Forty percent of the families in the State of Kansas had income of $ 10,000 or more wheras only 28 percent of the families in both Junction City and Geary County had income in this bracket.[18]

These lower family incomes as compared

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[18] General Development Plan, op. cit., p.15

FAMILY INCOME DISTRIBUTION, JUNCTION CITY, GEARY COUNTY, AND THE STATE OF KANSAS, 1970.

Income	Distribution		
	Junction City	Geary County	State of Kansas
Under $ 3,000	13.8 %	12.2 %	10.6 %
$ 3,000 - $ 4,999	20.4 %	18.8 %	11.5 %
$ 5,000 - $ 6,999	16.7 %	17.8 %	14.5 %
$ 7,000 - $ 9,999	20.9 %	22.7 %	22.9 %
$10,000 and over	28.2 %	28.5 %	40.5 %
Total	100.0 %	100.0 %	100.0 %
Median Income	$ 6,875	$ 7,137	$ 8,693

Source : U.S. Census of Population, 1970

TABLE 6

to the State are probably indicative of the large number of military families residing in both Geary County and Junction City. In the past, military income has been lower than comparable civilian income, but the trend is toward better pay in the future to encourage a " civilian " type military. Thus, median family income in the area can be expected to increase in the future.

(iii) Employment Trends

The analysis of the economy is the foundation upon which the analysis of the housing market rests. And the most important step in the analysis of the economy of a community is a detailed examination and analysis of employment.

In Geary County, civilian employment increased by nearly 50 percent from 1960 to 1970, with the most significant increases occurring in wholesale trade, services and government. Manufacturing employment increased by 40 percent, and finance, insurance and real estate showed an 11 percent gain. The most significant decrease in employment

recorded during the decade was a 54 percent drop in agriculture and mining, dramatizing the trend toward larger, mechanized farms, resulting in less agricultural employment. Retail trade employment decreased by 23 percent which is probably indicative of the fact that most of the retail trade in the area has been concentrated in recent years in large department and variety type stores, such as Walmart, Gibson, etc. Other slight employment decreases were recorded in the areas of transportation, communications, facilities in construction.

Military employment is a record of those civilians employed at Fort Riley. With troop strength expected to remain fairly stable at the Fort in the future, military employment trends can be expected to do likewise.[19]

Overall, employment in the County appears to be increasing and can be expected to continue in future years with increasing

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[19] Ibid.

population and the enthusiasm being exhibited in Junction City toward diversification by encouraging industry and new business. (Table 7)

b. CHARACTERISTICS OF THE CURRENT HOUSING SUPPLY

The purpose of this portion of the housing market analysis is to provide a general analysis of the current status of housing in Junction City and to provide insight into anticipated futrue housing demands.

(i). Housing Condition

The data on condition from the last survey are of most importance to give perspective as to current quality of housing. The chief usefulness of the distribution of the housing stock by condition is to reveal in the analysis a guide to the number of units in need of replacement.

In Junction City, a detailed housing condition survey was undertaken in November of 1967 and this information was updated in February, 1973. The housing condition survey provided for

EMPLOYMENT TRENDS, GEARY COUNTY, 1950 - 1970.

Employment Category	1950	1960	1970	Change			
				1950 - 1960		1960 - 1970	
				Number	Percent	Number	Percent
Manufacturing	187	227	319	+ 40	+ 21.4	+ 92	+ 40.5
Non-Manufacturing							
Retail Trade	1,196	1,596	1,223	+ 400	+ 33.3	- 373	- 23.4
Wholesale Trade	113	106	652	- 7	- 6.2	+ 546	+515.1
Finance, Insurance and Real Estate	125	225	250	+ 100	+ 80.0	+ 25	+ 11.1
Transportation, & Facilities	399	388	372	- 11	- 2.8	- 16	- 4.1
Construction	334	442	433	+ 108	+ 32.3	- 9	- 2.0
Services	1,060	1,443	2,868	+ 383	+ 36.1	+1,425	+ 98.8
Government	655	585	2,071	- 70	- 10.7	+1,486	+254.0
Agriculture and Mining.	831	558	256	- 273	- 32.9	- 302	- 54.1
Sub - Total	5,045	5,762	8,188	+ 717	+ 14.2	+2,874	+ 49.9
Military	4,726	6,976	3,500	+2,250	+ 47,6	-3,476	- 49.8
Total	9,771	12,738	11,688	+2,967	+ 30.4	-1,050	- 8.2

Source : U.S.Census of Population and Fort Riley Post Information Office, 1970.

TABLE. 7

the external rating of each housing unit as being in one of four categories of condition. These four categories and their description are :

Good Condition - These are structures which appearently do not need any repair or need only very minor repair.

Fair Condition - The structures categorized in this condition generally need more surface repair than those in food condition. Structures in this condition are identified by worn roofing, sagging steps, paint badly peeling, etc.

Poor Condition - This category includes structures with apparent structural weakness requiring major repairs such as sagging ridge lines, cracked, broken foundations, doors and windows out of plumb, etc.

Dilapidated Condition -

Tis category includes those structures with inadequate foundations, walls out of plumb, exterior roof and siding materials which will not provide adequate protection from the weather, and other serious deficiencies. These structures are for the most part beyond practical economic repair.[20]

The Table 8 shows the results of both surveys and a comparison of the 1973 data with the 1967 data.

In 1967, 73.6 percent of the housing units were classed in the standard condition and 26.4 substandard. The 1973 survey shows considerable improvement for such a short period. Only 23.5 percent of the housing stock was classed as substandard and during this time 36 dilapidated units were demolished. A total of 564 new housing units were constructed from 1967 to 1973 accounting for the relatively large increase in the number of standard structures.

COMPARISON OF HOUSING CONDITIONS, JUNCTION CITY, 1967 and 1973

Category	1967		1973		Change 1967 to 1973	
	No. of Units	% of Total	No. of Units	% of Total	No.[1]	%
Good	2,010	35.8	2,585	42.1	+575[3]	+6.3
Fair	2,119	37.8	2,113	34.4	- 6	-3.4
Poor	1,198	21.3	1,177	19.2	- 21	-2.1
Dilapidated	288	5.1	268	4.3	- 20	-0.8
Total[2]	5,615	100.0	6,143	100.0		

[1] A total of 36 housing units were demolished during this period.

[2] Includes all housing and apartment units but does not include the 1,032 mobile homes in the City.

[3] Of this total, 564 units were new building starts during the period and the remainder (11) were upgraded structures.

SOURCE : Oblinger - Smith Corporation, Consultants in planning, Design and Development, 1973.

TABLE 8

Both the number and percentage of houses in fair condition decreased from 1967 to 1973 indicating an undersirable trend. Also,the fact that over 19 percent of the housing in Junction City is in poor condition and 4.3 percent is in dilapidated condition indicates that special efforts toward upgrading housing in Junction City are essential. Thus, improvement of the existing housing alone will place considerable demands on futrue housing in Junction City.

(ii). Age of Housing

In general, as a housing unit ages, it becomes less livable due to physical deterioration and technical obsolescence. Physical deterioration can be reduced if the housing structure is well maintained but only to a limited extent. Technical obsolescence means older housing does not provide for many technological advances found in new houses. Although extensive renovation can solve this problem, the cost of such a project is often prohibitive.

Due to a lack of recent information, an exact breakdown of Junction City housing

as to year built is difficult. However, based on available data, Table 9 presents an approximate summary of tne age of housing as of January, 1973. The number of units for the 1970 - 1973 period is estimated from building permit information. The remaining information is from the U.S.Census, 1970. Of the 7,172 (estimated count) housing units in Junction City, 2,705 or 37.7 percent were built prior to 1939. Over 25 percent or 1,821 housing units were built from 1961 to 1973. At the current time, many of the housing units over 30 years of age are still providing satisfactory housing, but it is obvious that with such a significant percentage of housing units in this category, a replacement program is of the utmost importance.[21]

(iii). Housing Type

The change in distribution of the inventory by housing type is also an important housing characteristic. In 1970, over half of the housing units in both Junction City and Geary County were single-family structures. These comprised about 58 percent of the housing stock in Junction City and nearly 56 percent in the County.(Table 10)

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[21] Ibid., p.108

AGE OF HOUSING UNITS, JUNCTION CITY. 1973.

Year Constructed	No. of Units	% of Units
1969 to 1973[1]	573[1]	9.4
1960 to 1968	1,148	16.0
1950 to 1959	1,304	18.2
1940 to 1949	1,342	18.7
1939 and Earlier	2,705	37.7
Total	7,172	100.0

[1] Estimated from Building Permit Reports.

SOURCE : U.S.Census of Building, 1970, Kansas State and Small Areas, U.S. Department of Commerce,

TABLE 9

HOUSING TYPE, JUNCTION CITY AND GEARY COUNTY, 1970.

Housing Type	1970 Units		Percent of Total	
	Junction City	Geary County	Junction City	Geary County
Single Family	4,055	4,871	58.3	55.7
Two Family	971	1,160	14.0	13.3
Three and Four	683	786	9.8	9.0
Five or More	657	1,015	9.4	11.6
Trailer	587	919	8.4	10.5
Total	6,953	8,751	100.0	100.0

SOURCE : U.S.Census of Housing, 1970.

TABLE . 10

Two-family structures comprised the second largest percentage of housing units in both the City and the County.

In Junction City, a higher number of three and four family structures was recorded than five or more family structures, but in Geary County the opposite was true. Mobile homes comprised approximately 8.4 percent of the housing stock in the City, while in Geary County, they accounted for a higher 10.5 percent of the housing stock.

Table 11 records the number of residential building permits issued in Junction City from 1960 to 1972. Over the years since 1960, the heghest number of building permits issued in Junction City has been for single-family structures. As to other types of housing, during the period 1960 through 1967, 17 percent (140 units) of the total new building starts were apartments and duplex units. For the 1968 through 1972 period, 45 percent (232 units) of the total new building starts were apartment and duplex indicating an increasing trend toward multi-family type housing.[22]

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[22] Ibid., pp. 110 - 111

RESIDENTIAL BUILDING PERMITS ISSUED
NUMBER OF UNITS, JUNCTION CITY.1960 - 1972.

Year	Single Family	Duplex Units	Apartment Units	Total Units
1960	96	1	6	103
1961	81	4	-	85
1962	122	1	-	123
1963	98	-	8	106
1964	105	-	12	117
1965	131	-	96	227
1966	32	1	11	44
1967	45	-	-	45
1968	49	2	-	51
1969	43	24	-	67
1970	42	6	131	179
1971	63	6	56	125
1972	87	-	7	94

SOURCE : Junction City Inspection Department, 1973.

TABLE 11

(iv) Tenure .

Tenure is an occupancy characteristic of housing units and is probably the most important indivisual housing characteristic. The occupancy status of the housing inventory is classified in three broad categories: Owner-occupied, Renter-occupied,and Vacant units. Vacant units are subdivided as available for occupancy and not available. Available vacant units are classified as being either for sale only or for rent; The former are allied with the owner-occupied segment of the inventory and the latter with the renter-occupied segment.

The number and proportion of units owner-occupied, tenant-occupied,and vacant have historical and current significance. It reflects the cumulative effects of past trends and is a basis on which future need is determined.

In 1970, 50 percent of the occupied housing units were owner-occupied units and 50 oercent were renter-occupied units in Junction City. Of the total housing

units,183 or 2.7 percent were available vacant as compared to the higher 5.3 percent available vacancy in 1960. Regarding the percent of distribution of owner-occupied units since 1950, it would appear that there is a trend toward more owner-occupied units in Junction City in recent years.(table 12)

(v). Value and Rent

Distribution of the housing inventory by rent and value are useful primarily in providing an understanding of its qualitative composition and character. Data in the last census report provide perspective on the quality of the housing stock as informative background.

According to the U.S. Census of Housing, the median home value in Junction City in 1970 was $ 14,4000 which was slightly higher than the median value of $ 14,100 for Geary County. Median rent in Junction City was $ 81, slightly lower than median rent of $ 83 in the County. As shown in Table 13, the hightest percentage of homes for both City and County were in the $ 10,000

RENTER - OWNER OCCUPANCY, JUNCTION CITY AND GEARY COUNTY.
1950 - 1970

Junction City	1950	1960	1970	Percent Distribution Owner-Renter 1950	1960	1970
Owner Occupied Units	1,944	2,835	3,351	44.1	47.2	50.3
Renter Occupied Units	2,461	3,168	3,305	55.9	52.8	49.7
Total Occupied Units	4,405	6,003	6,656	100.0	100.0	100.0
All Vacant Units	138	424	297			
All Housing Units	4,543	6,427	6,953			
Available Vacant Housing	85	318	183			

SOURCE : U.S.Census of Housing, 1970.

TABLE 12

DISTRIBUTION OF HOME VALUE AND RENT,
JUNCTION CITY AND GEARY COUNTY, 1970.

VALUE	Junction City		Geary County	
	Number	Percent	Number	Percent
Under $ 5,000	97	3.7	79	2.8
$ 5,000 - $ 9,999	451	17.3	486	17,4
$10,000 - $14,999	859	33.0	999	35.7
$15,000 - $19,999	633	24.3	641	22.9
$20,000 - $24,999	316	12.1	351	12.5
$25,000 or More	250	9.6	241	8.6
Total	2,606	100.0	2,797	100.0
Median Value	$ 14,400		$ 14,100	
RENT	Junction City		Geary County	
	Number	Percent	Number	Percent
Under	274	6.6	47	1.1
$ 40 - $ 59	1,044	25.0	329	7.7
$ 60 - $ 79	1,414	33.9	1,253	29.9
$ 80 - $ 99	616	14.8	900	21.5
$100 - $119	241	5.8	931	22.2
$120 or Over	401	9.6	117	2.8
No Cash Rent	186	4.5	608	14.5
Total	4,176	100.0	4,185	100.0
Median Rent	$ 81		$ 83	

SOURCE : U.S.Census of Housing, 1970.

TABLE 13

to $ 14,999 range, and the highest percentage of rental units fell into the $ 60 to $ 79 per month range.[23]

c. DEMAND FOR HOUSING

Estimates of the projected demand for new housing, come from the net impact of the operation of the determinants of demand upon the currect housing supply, are concerned with both the quantitative and qualitative aspects of demand. These estimates necessarily must be made in sequence since they cannot be made simultaneously in one operation; the quantitative estimates necessarily precede the estimates of qualitative distribution.

(i). Quantitative Demand for Housing

Based on the assumption of an increasing population of 19,843 during the next 20 years, and based on an average household size of 2.9 persons per household, it is anticipated that over 6,870 additional housing units will be needed. Currently, there are very few vacant housing units in Junction City available for rent. So approximately 340 new housing units per year will be required

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[23] Ibid., p.30

to meet the demands created by the anticipated population growth.

(ii) Qualitative Demand for Housing

Qualitative demand relatives to the distribution of the net quantitative demand for new single-family sales housing and multi-family housing by price and rent.

The qualitative aspects of new construction demand also relate to the determinable preference for structural types, design, and amenities. Based on the current housing types and residential building permits of Junction City from 1960 through 1972, it is estimated that single-family units will comprise about 65 percent of the total projected housing units of 6,870 with multi-family units and mobile homes comprising 25 percent and 10 percent respectively.

According to the economic analysis of Junction City, in 1970, it is estimated that over 34 percent of the households have a disposable annual income of less than $ 5,000. These families simply cannot afford to pay monthly payments of $ 200 and more which are required for a new $ 20,000 house financed with

minimum down payment. So a number of low cost housing around medium value of $ 14,400 for single-family, and around medium rent of $ 81 for multi-family are most needed.

d. SUMMARIZATION

Since materials and labor have been going up housing construction yearly since 1970, the figures of $ 14,400 for single -family and $ 81 for multi-family in rent are not true any more as far as 1976 is concerned. They need to be adjusted, based on a practical percentage of increase in cost.

According to the fact that IBF of Fir cost 14½ ¢ in 1970, but 28¢ in 1975, IBF of white pine cost 45¢ in 1970, but $ 1.30 in 1975, and that minimum wages for labor increased from $ 1.60 to $ 2.30 per hour in the period of 1970 to 1975, a 10 percent increase yearly in cost is practical. So, $ 14,400 will end up as $ 23,000 and $ 81 as $ 130 in the year 1976.

As to the area, over 50 percent of the land in the site will be for residential use.

2.MARKET ANALYSIS FOR COMMERCIAL LAND USE

a. DEMAND FOR " SHOPPING GOODS " SPACE

(i). The Trade Area

Typically, various store types have widely different trade areas. Shoppers goods department store items,some clothing items and furniture. These are usually " big ticket " items which require comparison when shopping. Buyers are therefore willing to drive relatively long distances in order to secure a variety of merchandise for comparison. For example, residents of Junction City sometimes drive as far as Kansas City to purchase major clothing items, furniture and the like. Thus the trade area for so called " shoppers goods " extends well beyond Geary County. It encompasses major portions of Clay,Dickison,Morris and Riley Counties, as well as smaller portions of Pottawatomie and Wabausee Counties.Naturally the trade area includes all of Geary County.

(ii). Purchasing Power of the Trade Area

Population and income are the major dynamic forces in aggregate trade area purcgasing power growth.

While population grows as forecast in Table 14 average per capita and per household expenditures for GAF store items will also be growing in response to increasing levels of real personal and family income. To obtain an even more sensitive reading, the Oblinger-Smith Corporation has projected GAF purchasing power for three segments of the market, which together constitute the total market : (1). Households or families, (2). Students at Kansas State University, and (3). Troops at Fort Riley not living in households. Careful estimates of aggregate GAF purchasing power potantial of each of these key groups have been made, indicating that Trade Area GAF purchasing power, could approach approximately 80 millions by 1985 and 110 million by 1995.

(iii) Purchasing Power to be Attracted to Junction City

Due to the competition of other urban centers in this trade area, the potential purchasing power of the trade area will not be totally attracted to Junction City. According to the sale statistics in the 1972 issue of " Survey of Buying Power ", GAF stores in the County in 1971 were achieving sales of 13.6 million. Comparing actual sale performance as measured by the Census with estimated

POPULATION FOR JUNCTION CITY'S "GAF TRADE AREA" 1963 - 1995

Year	Population	Household
1963	90,000	24,500
1972	110,000	38,000
1985	130,000	44,800
1995	165,000	57,000

SOURCE ; 1963 and 1972 : adjusted from County source.

1985 and 1995: Consultant projection.

Table 14

trade area, GFA purchasing power for the same year, it was noted that Junction City and Geary County were attracting about 25.5 percent of trade area purchasing power potential. With the recent opening of the new Walmart and Alco stores, the percentage has probably gone up on a theroretical basis; however, the sale from these two facilities were not reflected in the 1971 sale figures.

Looking to the future, it is predicted that Junction City can at least hold its present share (about 25 %) of trade area purchasing power, meaning that GAF sales in Junction City can grow at least as fast as the growing of trade area purchasing power. However, it is quite possible that Junction City can increase its " capture " of trade area purchasing power, so that the outlook for Junction City GAF sales is for growth due to :
(1) A bigger trade area purchasing power " pie "
(2) Greater " capture " of the trade area purchasing power total, a greater share of the total trade area " pie ".

If the City is able to increase somewhat its share of the market as described above, retail sales of the GAF variety in Junction City could

feasibly grow by $ 18.8 million between 1972 and 1995, going from a 1972 total of about $ 13.6 million to $ 32.4 million by 1995. Sales growth of this magnitude suggests that Junction City's share of the trade area purchasing power would actually increase from its present approximately 25 percent to nearly 30 percent.[24]

(iv). Demands

A reasonable average sales productity per square of new store space would be $ 80. Thus, dividing $ 18.8 million in GAF sale growth by $ 80 per square foot, a total growth in GAF space of some 236,000 square feet is indicated. By drawing large volumes of regional shopper traffic into the Junction City area, this GAF store space increment would support other stores of a specialty and convenience nature, much as specialty stores are supported along the malls of department store-oriented shopping centers. Approximately 19,500 square feet of such " dependent " space would bear the approximate ratio to the growth of 255,500 square feet in the GAF category. Thus, in total, Junction City's outlook for growth in retailing space is on the order of 255,500 square feet in the

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[24] Ibid. , pp. 38 - 41

period 1972 to 1995. Removing the new Wards, Walmarkt and Alco store space from this total, a final estimate of about 150,000 square feet of new shoppers goods store space is reached.

Then, the total areas of 11.5 acres will be figured out through a series of calculations as follows:

- Gross square feet of new snoppers goods stores space projected 150,000
- Parking space required at 6 per 1,000 square feet .....6x150,000/1,000 = 900
- Square feet of parking space required at 400 sq.ft. per space ....400x900= 360,000
- Ground area required for stores at FAR 1.1 (Assumpted)......150,000/1.1 = 136,000
- Miscellaneous other ground area (acess, etc.)..... = 8,000

TOTAL GROUND AREA REQUIRED .....= 504,000 sq.ft.

b. DRMAND FOR " CONVENIENCE GOODS " SPACE

(i). The Trade Area

So called " convenience goods " category includes food stores, drug stores, variety stores and others such as service establishments which include cleaners, laundries, barber shops and beauty shops. These are the

traditional store types found in local shopping centers oriented to near-by residential communities. Typically, tne key " generator " in such shopping centers is the food store.

Because shoppers do not travel great distances to make tneir convenience goods purchases, the trade area for this type of stores space in Junction City is the City itself and close-by Geary County, for the most part.

(ii) Purchase Power of the Trade Area

In 1963, the U.S. Census of Business reported sales in tne convenience goods category at about $ 11 million for Junction City. The figure for Geary County, including Junction City, was virtually idential. Statistically, this volume amounted to approximately $ 480 per capita, considering the populations of Junction City as well as Geary County.

Looking ahead to 1995, the population of Geary County, excluding Fort Riley, will then stand at some 46,281. Per capita expenditures in the convenience goods category will have risen dramatically by 1995, to perhaps $ 720 at a probable growth rate of about two percent per year, This combined growth in both population and in available purchasing power for convenience goods items will result in a County

market of over $ 33 millions. ($ 750x46,281) Based on the present distribution of sales in the convenience goods category as between the City and County, it would appear that virtually all of the convenience goods store sales growth will occur in the City, producing a city growth of about $ 15 million over that estimate for 1971.[25]

(iii) Demands

A growth of $ 15 million in convenience goods sales in the City between 1972 and 1995 suggests the need for new convenience goods store space of about 200,000 square feet. This square footage allows for a sales productivity per square foot of about $ 80 to $ 100, an appropriate average for stores of this type.

Performing a somewhat similar analysis with respect to the growth in the food store market in Junction City, the Oblinger - Smith Corporation arrives at the conclusion that approximately three or four new supermarkets will be required in the future, together with a number of smaller food sales outlets. Each of these centers might include 30,000 to 50,000 square feet of floor space for a total of about 160,000 square feet of additional

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[25] Ibid. pp. 41-43

space in convenience shopping convenience shopping centers overall. This 160,000 square feet of convenience goods space in shopping centers still allows for construction on other convenience type retail facilities at highway-oriented locations, to round out the full 200,000 square feet projection for the convenience good store category. Each of three or four shopping centers, at 30,000 to 50,000 sq.ft. with required parking, will require approximately three or four acres of land at full development.

c. DEMAND FOR SERVICE COMMERCIAL SPACE

This kind of commercial uses to include office, automotive sales and services, and highway activities such as drive - in restaurants, motels,and lumber yards could well consume an additional 25 to 40 acres of well-located highway-oriented land in the period up to 1995. (Table 15)

d. SUMMARIZATION

Based on the analysis of commercial use in Junction City, it is expected that 50 to 72 acres of commercial land will be needed in the future. It is recommended that the CBD of the City be retained as it is. So the additional demands for commercial land will be located on the place which

SUMMARY OF COMMERCIAL LAND USE NEEDS . JUNCTION CITY

1972 - 1995

Type	Acres
For" shoppers Goods" stores & parking	10 - 12
For " Convenience Good " Shopping Centers	15 - 20
For highway - oriented and office uses	25 - 40
TOTAL	50 - 72

SOURCE ; Oblinger - Smith Corporation, Consultant in Planning, Design and Development, 1973.

Table 15

is near major streets and a little far from the CBD.

The selected site for development, with the advantages of accessibility and size, will be the ideal location to accommodate some of the additional commercial activities.

Therefore, 20 percent of the total 140 acres of the site will be used for commercial use.

3. ELEMENTARY SCHOOL

a. ENROLLMENT TRENDS

It is estimated that 12.7 percent of the population of 41,800 in 1995 will be of elementary school age. This indicates that approximately 5,310 students will be attending school by 1995.

b. EXISTING ELEMENTARY SCHOOL FACILITIES

There are six elementary schools within the City. Of which the Franklin, Sheridan, and Departmental appear to be inadequate to perform the functions required at these school sites. In addition, Departmental School and Washington School are located adjacent to heavily traveled streets. Departmental School is becoming obsolete and is approaching 70 years of age.

The remaining elementary schools serve their educational functions well and are located on adequate sized sites.[26]

c. SUMMARIZATION

As the City grows, school service area boundaries will have to be adjusted and new school facilities added.

The selected site, with the advantages of access, size, soil and future expansion, will be a suitable location for a new elementary school to serve not only this new PUD area, but also the adjacent neighborhoods.

Therefore, a minimum of 15 acres for about 400 pupils will provide for use as school land.

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[26] Ibid., pp. 82-90

4. OPEN SPACE

The darkest areas on the Composite Map of the site analysis, which are most undesirable and difficult for development, will be perserved for open spaces and recreational areas in the site.

B. LINKAGES

When the types of proposed land use have been decided, then the linkages between them have to be analyzed. These linkages include the movements of people, goods, and wastes or the connections of amenities. Besides the links among the proposed land uses of the site, the links between the site and the existing activities, such as schools, churches, stores, and recreation areas, will be also analyzed. According to the analysis, the proposed land uses on the site will be residential, commercial, educational, and recreational. And the major existing surrounding activities are YMCA, Rimrock Lake, First Church of Nazarene, County Hospital, and etc. The diagram below shows the linkages among the land uses and activities said above. It is not to scale and express nothing but the types of uses and their preferred connections. (Figure 18)

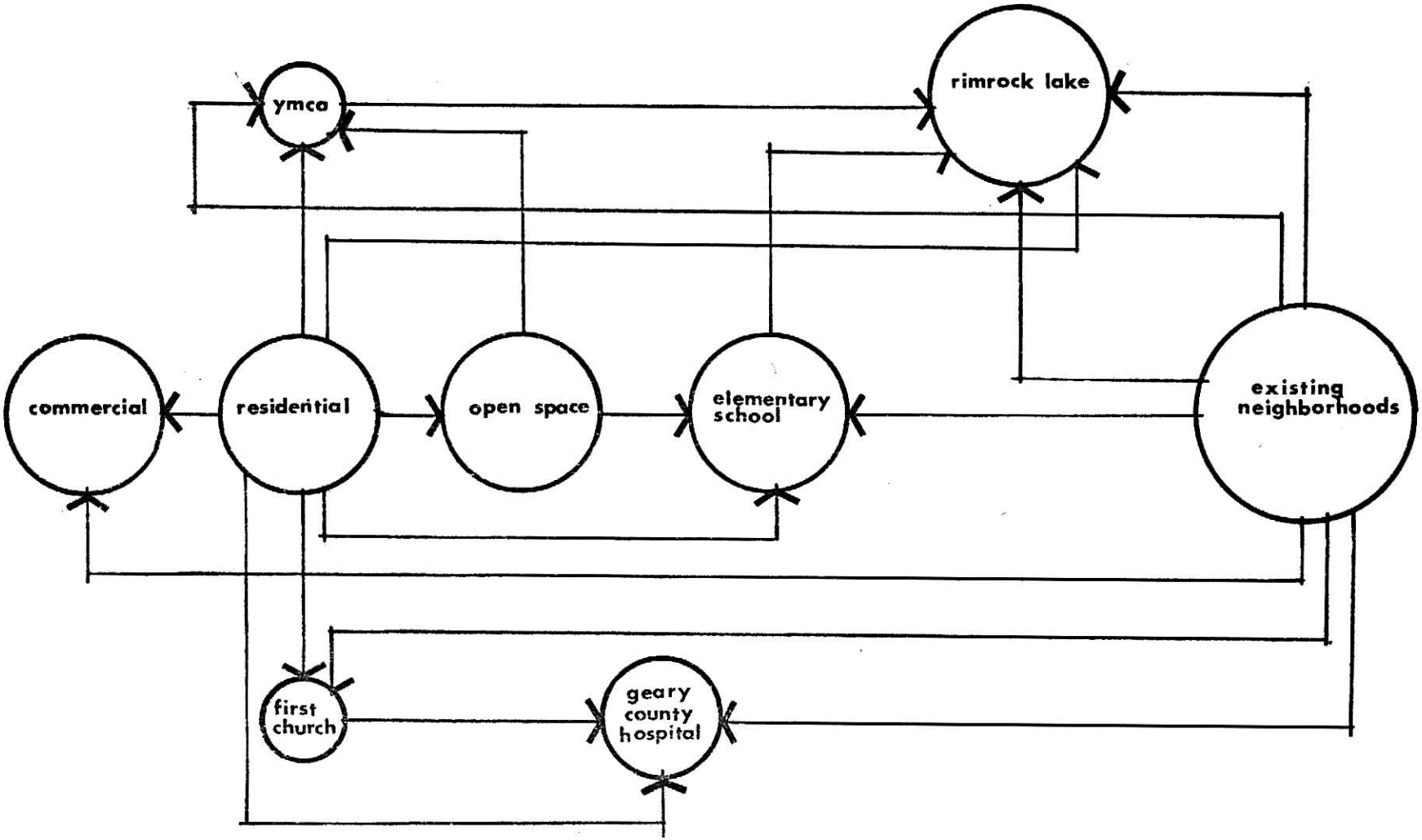

Figure. 18

LAND USE DIAGRAM

C. LAND USE CONCEPTS

The land use concepts are developed through the land use diagram, with the Composite Map of site analysis in mind. So they respond to the characters of the site, and also show the general functional arrangements of the proposed land uses.

The land use concepts of the selected site are shown on the Map. On the Map, the low and medium density residential areas are placed on the gentle slopes of the east of the site and on the tract of land, which is located on the west and along the U.S. 77. The high density residential area is placed on the middle of the site. The commercial uses are located on the corner of U.S. 77 and Ash Street. The tract, reserved for elementary school, is located on the south of the site. As to open space, the ponds and stream valley are the dominant parts of it, whcih is running through the residential area of the site. (**Figure 19.**)

LAND USE CONCEPT

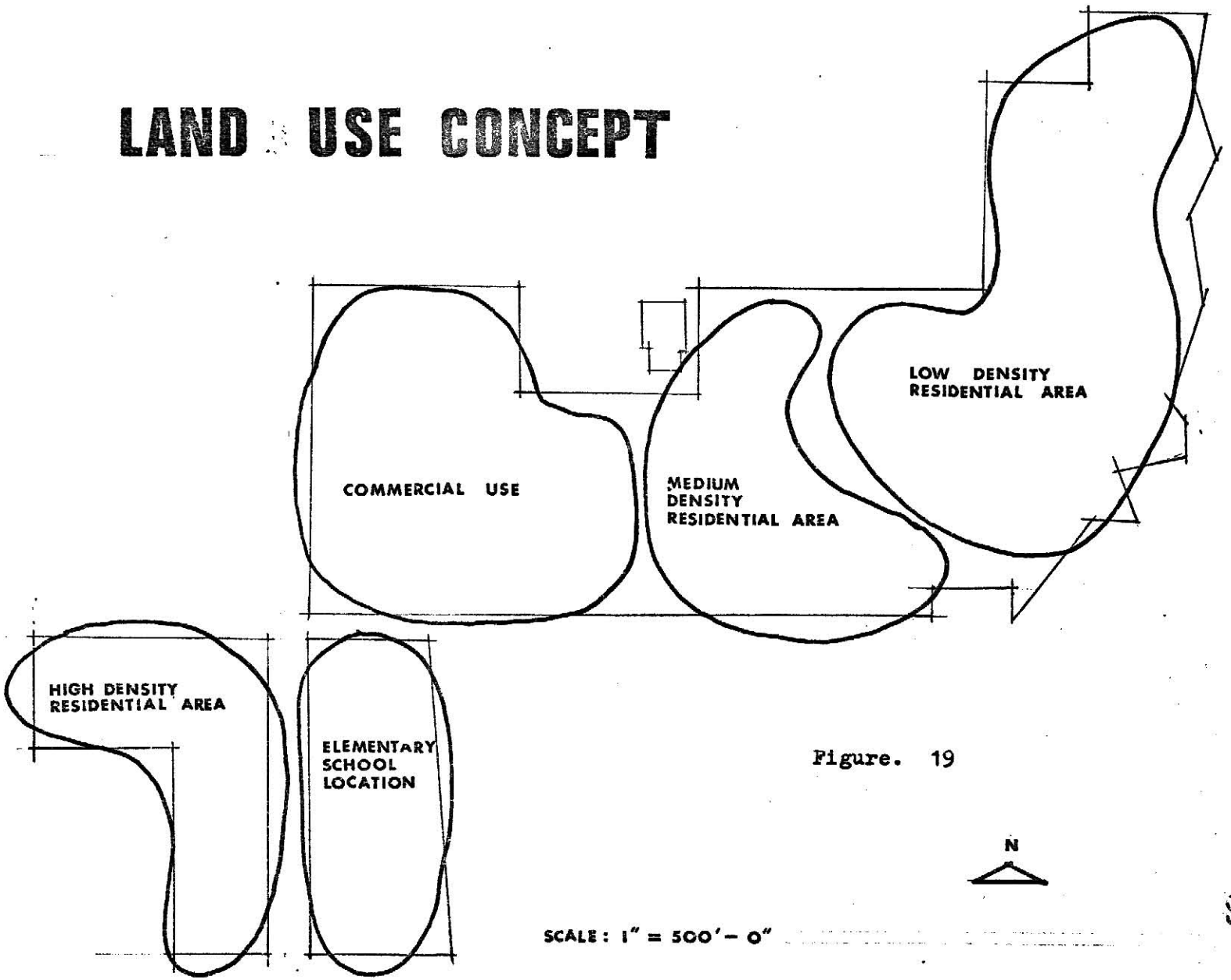

Figure. 19

CHAPTER II. THE PLANNING CONCEPTS

A. MIXTURE USES

The mixture uses, emphasizing the mixture of land uses, dwelling types, and densities, is a major part of the PUD concept.

The mixing land uses of residence, commerce, and school, which are decided by the process of analysis, will accomplish a compatible and healthy PUD for the site.

As to mixing dwelling types, the single-family, duplex, townhouse, and apartment will be the major four different housings on the site. The advantages of mixing dwelling types are avoiding monotous repetition of a single type, reserving more land for man to utilize for the purpose of enjoyment, and providing wide diversity of housing types from which to choose.

As far as the density is concerned, there is, in fact, no such thing as an ideal density. The suitability of a density varies from site to site, dwelling type to dwelling type. There are four different dwelling types included in this PUD, and each dwelling type has its own appropriate density, mixing densities, therefore, are developed.

The density of each type of dwelling is very difficult to choose. If the density is too low, it will result in high costs of land development, increased outlay for operating utility services, and long travel distances. On the contrary, if too high, it will result in low livability in terms of air, light, and open space. Therefore,the reasonal densities for dwelling types on the site are listed below :

Single -family	1-5 family/acre
Duplex	6 - 10 "
Townhouse	15- 19 "
Apartment	20- 30 "

B. OPEN SPACE SYSTEM

Open space planning as a system represents a breakaway from the traditional block and lot building patterns. It, the public streets and the individual homes are the three integral parts of the planned unit development.

On the site,the stream connecting the ponds and communal spaces to create a continous flow of greenway will be the major open space system. This greenway will also be connected to off-site open space and recreation areas of Rimrock Lake and YMCA, forming

a continous flow of space through and off the site.

The recreation center and other facilities will be located at the center of the open space system in order to be convenient for the most people.

C. CIRCULATION SYSTEMS

1. VEHICULAR CIRCULATION

Fundamentally the vehicular circulation will follow the existing contours and around each type of land uses, not through them. In order to avoid many potential traffic hazards, the streets are laid out in a way that discourages high speeds, that discourages nonresidents from using a housing site as a shortcut, and that avoids bisecting large open areas.

Cul-de-sac and loop are used for providing safest access to and from homesites in small housing groups.

2. PEDESTRIAN CIRCULATION

The purpose of the pedestrian circulation is to lead in an unbroken ribbon from residences to school, to major open space, and to the community facilities. In addition, pedestrians will have a place to enjoy a pleasant walk, a place to push the baby carriage, and a place to ride a small vehicle. It is possible to design for pedestrians

in a way that will not only serve as a utility, but also be a beauty.

Steps will be avoided when possible. Ramps for easy change in grade will be used as they make the transition easier for wheelchairs, as well as elderly residents. At major crossroads, if possible, underpasses or overpasses will be provided to ensure safety from vehicular traffic.

D. CLUSTER CONCEPT

The concept of cluster is, according to the characteristic of the site, grouping the houses tightly together and preserving the land thus saved for common open space.

The advantages of this concept are that the developer, by cutting the length of street and utilities, and by allowing flexibility to preserve natural features, can reduce the per unit costs, and that the houseowners can have small, private yards as well as large common areas of green open spaces for outdoor enjoyment.

CHAPTER III. THE LANDSCAPE DESIGN CONSIDERATIONS AND CRITERIA

A. RESIDENTIAL LAND

1. LOTTING

a. LOT LINES

- It should be approximately at right angles to the street or radial to a curved street.
- Lot lines normally should be straight.
- Avoid acute angles with side lines except under special topographic conditions.
- Avoid odd-shaped or pie-shaped lots
- Streets that intersect at acute angles should be avoided.

b. LOT SIZE

- A function of the customary zoning ordinance.
- It varies throughout the country.
- The lot depth should be about twice its width.
- corner lots may be required to have extra width so as to have appropriate building setbacks from both streets.
- Lot size varies among the types of dwelling unit.

The lot size for each type of housing on the selected site, according to the densities, are set as follows :

Housing Types		Lot Size	Density
✓ Single-family		100' x 200'	2 units/per acre
	to	80' x 150'	4 "
✓ Duplex		65' x 100'	7 "
Townhouse		25' x 100'	18 "
✓ Apartment		-------	25 "

c. BUILDING LINES

- Building setbacks depending on the street right- of- way, ranging from 15' to 50 feet.
- 25 feet setback is the minimum requirement of Junction City's zoning ordinance for the front and rear yards.

2. HOUSING ARRANGEMENTS

a. SINGLE - FAMILY AND DUPLEX HOUSES

The single-family detached houses and duplex houses are placed on the east section of the site and surrounding by the Rimrock Lake of the City and its own major open space. The houses, therefore, are orientated and designed in a way that the interior rooms can face these desirable and attractive green areas.

b. TOWNHOUSE

The townhouse, once known as the low house, is a single-family attached-unit with party walls. it is a transition between the single-family detached house and the garden apartment.

The proposed townhouse buildings of the project are arranged in a series of five to eight units on the major rolling slopes of the site. By clustering groups of townhouses, open spaces are, therefore, produced, which link up with the major open space system of the site.

In order to take advantage of the rolling land and to have a convenient access to the common open space, the townhouse is designed to be a two-story building with rear garden.

c. GARDEN APARTMENT

Garden apartment with open space and garden as its dominant design features, is a mixture of row house and walk-up apartment. Its maximum height is three stories, and usually it consists of two family units.

Though the designed density for garden apartment is higher than that of single-family, duplex, and townhouse, by clustering the houses and by increasing the height of houses up to

three stories, considerable land can be saved for open spaces.

The garden apartment buildings are arranged in such an irregular pattern that the wind speed will be disturbed and reduced when it passes through this area.

The spacing between apartments is also considered in terms of adequate light and air, which are basic human requirements. 30 feet is, therefore, set as the minimum spacing for apartments.

3. STREETS AND PARKING

a. CRITERIA OF STREET DESIGN (based on maximum of 25 mph in speed)

Local Street	Single-family	Multi-family
- R.O.W. Width	60 feet	60 feet
- Pavement Width	30 feet	30 feet
- Curbs	Straight	Straight
- Cul - de-sac	1000 feet maximum length	500 feet
- Turn-arounds	40 feet minimum curbradius	same

b. PARKING

(i) Single-family, and Duplex Areas

- Private garage or space, with private driveway, will be provided.
- No less than two parking spaces per dwelling unit.

(ii)Townhouses

Two spaces per unit will be provided, and parking will be handled in following ways:

- In front of the house in a street parking bay or within a cul-de-sec.
- In a garage or carport adjacent to the house.

(iii)Garden Apartment

- One and one-half parking spaces per apartment unit will be provided.
- Additional spaces for guest parking will be provided too.
- Street will not be used for parking.

4. ECONOMY CONSIDERATIONS

The analysis of housing demand in Junction City shows that the houses, ranging around $ 23,000 in cost and around $ 130 in rent, will be most needed. So the goal of this housing project will be a

monthly-payment range that would make home ownership affordable by, and appealing to the medium income families.

To reach this goal, two-bedroom, three-room townhouses and apartments will be designed as efficient as possible in the use of materials and mechanical equipment, then adding the necessary appliances and other amenities untill the designed monthly-payments of $ 130 to $ 150 are reached without any sacrifice in house size and location.

Also some high-cost houses will be designed in the single-family section, duplex section and multi-family section in order to meet the needs of high income families.

B. SHOPPING CENTER

1. THE ESTIMATE OF GROSS BUILDING AREA

According to the market analysis of commercial land of Junction City, it is estimated that three or four new supermarkets of conventional goods and 150,000 square feet of new shoppers' goods store space are required around Junction City in future.

Because the shoppers will not travel great distances to make their conventional goods purchases,

the estimated three or four supermarkets have to be located separately in different spots which are close to the local people they serve. Therefore, one of these four supermarkets will be located on the site of this project to serve the population of the site itself and its surrounding areas. The building area of a supermarket may vary. So an assumption of 50,000 square feet is made here.

With regard to the shoppers goods, which are department store items, clothing items, furnitures and so on, since shoppers will not mind driving long distances to make comparison and purchases, and since the concentration of stores will provide more opportunities of comparison and less driving for shoppers, it is suggested that shoppers goods stores be placed at a spot, which can serve the population of a region.

The 150,000 square feet of estimated shoppers goods store areas, therefore, can all be placed on the site of the proposed PUD, because of its good location. The new shopping center, then, at last come up with a gross building area of 200,000 square feet by adding 50,000 square feet

of conventional goods space to 150,000 square feet of shoopers goods store space.

2.THE ALLOCATION OF SITE AREA

In allocating the Site Area (SA) of one story high shopping center, the formula shown below can be applied.

SA = GA

The Ground Area (GA) is made up of the following major elements:

- Shopping Core Area ....(CA)
- Transportation Area....(TA)
- Buffer Area .....(BA)

Therefore;

SA = CA + TA + BA

And CA is made up two elements:

- Building Area .....(BA)
- Space between structures.....(SP)

Therefore; the formula at last will be :

SA = BA + SP + TA + BA (Figure 20)

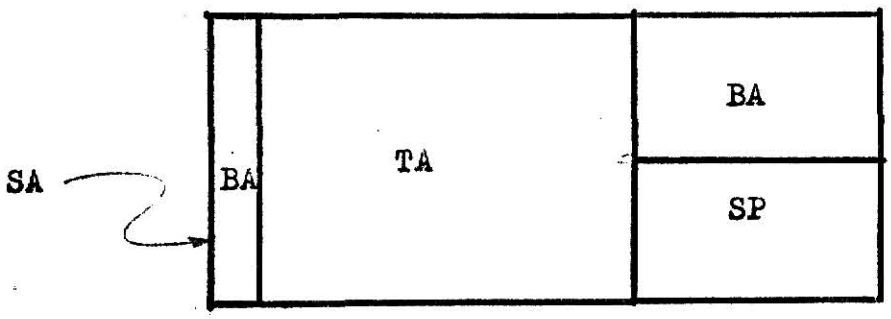

Figure 20

In this formula:[27]

- The total space between structures (SP), consisting of pedestrian areas, landscaped areas, open spaces, etc, approximately equals to the gross Building Area (BA).
- The TA, consisting of parking area(PA) and traffic movement area(MA), is about 4.5 times the BA.
- The Buffer Area (BA), consisting of buffer zones may take up considerable land portions. 10 % of BA may be enough for necessary protection of surrounding areas.

Therefore, formularized this becomes :

$$SA = BA + BA + 4.5BA + 1/10BA$$
$$= 6.6\ BA$$
$$= 6.6 \times 200{,}000 \text{ square feet}$$
$$= 1{,}320{,}000 \text{ square feet}$$
$$\doteq 30 \text{ acrea}$$

This result indicates that, based on the analysis, assumption, formula and calculation, a tract of 30 acres will be needed for the development of the new one story shopping center on the site of PUD.

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[27] Victor Gruen and Larry Smith, Shopping Townds USA, New York: Reinhold Publishing Co. 1960,p.88

3. THE DESIGN CONCEPTS.

a. CLUSTER ARRANGEMENT OF STORES

The new shopping center, consisting of a free-standing supermarket structure, a multi-tenant structure in the department store class, and some other individual tenant stores, are arranged and placed, by the principle of clustering, on the center of the site.

This kind of arrangement will result in the advantages of reducing the pedestrian traffic from store to store, of forming pedestrian court or mall to protect the shoppers against sun, rain , wind,snow, as well as cars, and of creating a compact and attractive architectural complex.

As to the orientation of stores,all except the department stores, will be designed to be exposed both to parking traffic and shopping traffic so that a high sales volume may be expected. The department store, as the magnet of the complex will be exposed to the shopping traffic only. Because of the superior pulling power of the department, this arrangement will result in no detriment to its business but offer the opportunity of guiding shopping traffic

from parking areas along the frontage of other stores toward the center of the cluster, the location of the department store.

b.SEPARTATION OF VARIOUS TRAFFIC TYPES

Usually, four kinds of traffic occur in the shopping center. They are private automobile traffic, public transportation traffic, service, and pedestrian traffic. Since there is no public transportation system in Junction City at the present time, the public transportation traffic will not be considered in this new shopping center.

The automobile traffic and service traffic will create certain amount of danger, noise, fumes, odors, confusion and distraction. These characteristics will result in tensions and feelings of anxiety in the shoppers which will distract them from shopping.

Also, the noise, odors, fumes and the constant movement of vehicles will diminish or destroy the attainment of a psychological climate conducive to shopping enjoyment.

Therefore, it is necessary to separate automobiles and trucks from people and to establish exclusive pedestrian areas.

The service traffic, including service vehicles for deliveries, pick-ups, trucks of utility companies, garbage and trash collection, repair crews and etc.,is not shopping traffic. So some degree of separation between service traffic and shopping automobile traffic is also necessary.

c.CONVENIENCE

Convenience is the key principle of planning this new shopping center.

Convenient access and exit arrangements for automobile from the public highway to the site, convenient arrangements for reaching the parking areas within the site, convenient parking space, convenient pedestrian area, and convenient store areas are all considered.

d. BUFFER ZONE

The buffer zone, as the extension of major open space system is planned to protect the new residential area from noise, dangling wires, trash, loading docks and etc..

4. CAR STORAGE ARRANGEMENT

a. Walkways and landscaping are provided to break the whole parking area into smaller lots.

b. Lightpoles will be located within the parking area at the proper spots.

c. Stalls are arranged at 90 -degree angles, which will make parking easier, quicker, and more accurate.

d. Stall widths range from 9 feet to 10 feet. These wide stalls will speed parking operation, will avoid space-wasting straddling of lines, and allow car doors to be open without damaging to neighboring automobiles.

CHAPTER IV. LANDSCAPE ARCHITECTURE PRESENTATION.

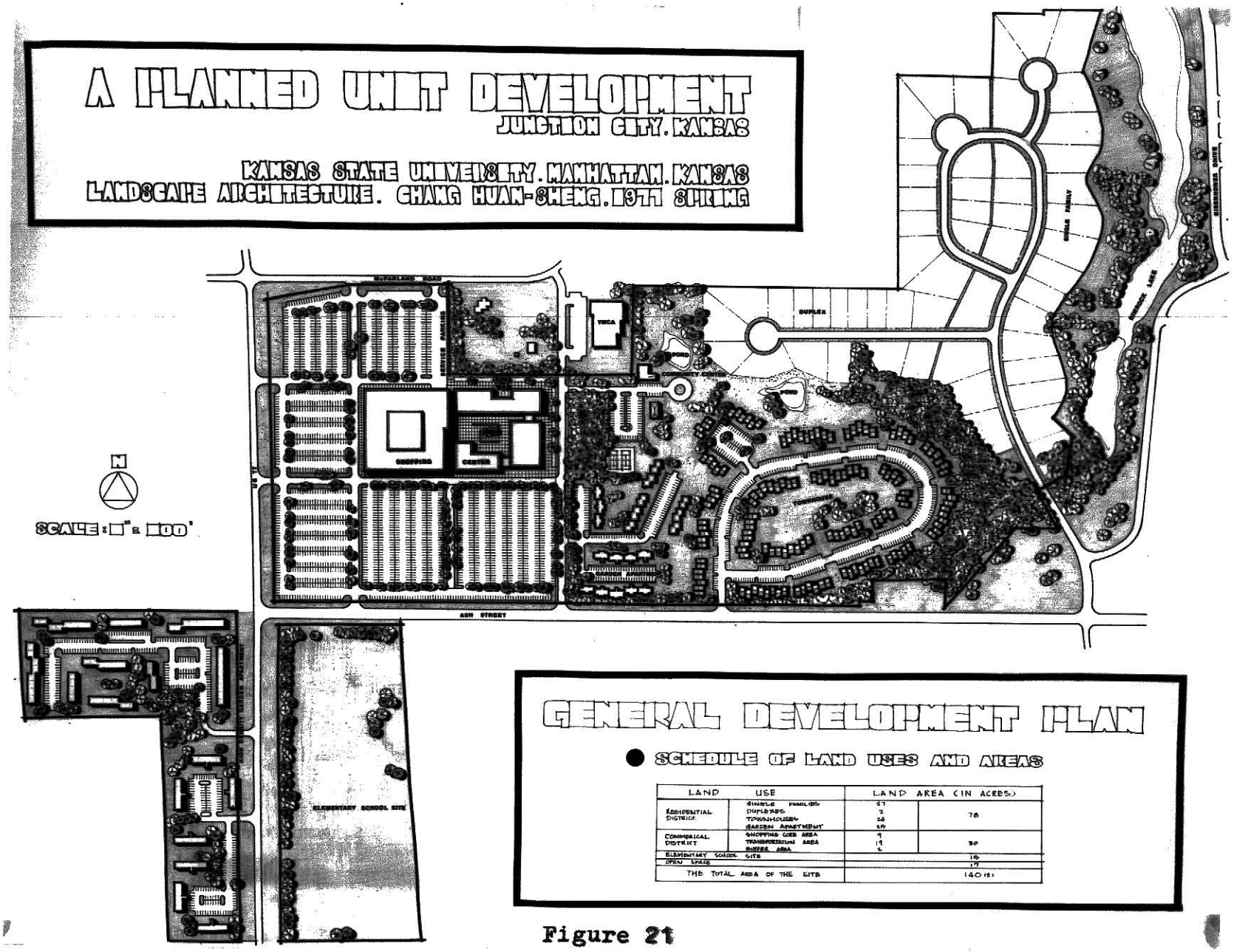
A PLANNED UNIT DEVELOPMENT
JUNCTION CITY, KANSAS
KANSAS STATE UNIVERSITY, MANHATTAN, KANSAS
LANDSCAPE ARCHITECTURE, CHANG HUAN-SHENG, 1977 SPRING
N
SCALE: 1" = 100'
McFARLAND ROAD
ASH STREET
YMCA
DUPLEX
ELEMENTARY SCHOOL SITE
GENERAL DEVELOPMENT PLAN
SCHEDULE OF LAND USES AND AREAS
LAND USE
LAND AREA (IN ACRES)
RESIDENTIAL DISTRICT
single family
duplexes
townhouses
garden apartment
27
7
14
10
78
COMMERCIAL DISTRICT
shopping core area
transportation area
buffer area
9
19
2
30
ELEMENTARY SCHOOL SITE
16
OPEN SPACE
17
THE TOTAL AREA OF THE SITE
140 (±)

Figure 21

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THE SITE PLANNING OF A PLANNED UNIT DEVELOPMENT FOR A SELECTED SITE IN JUNCTION CITY, KANSAS.

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AN ABSTRACT OF A MASTER'S THESES

submitted in partial fulfillment of the

requirements for the degree

MASTER OF LANDSCAPE ARCHITECTURE

Department of Landscape Architecture

KANSAS STATE UNIVERSITY

Manhattan,Kansas.

1977

This study involves the preparation of a General Development Plan for the Planned Unit Development of a selected site, which is located in Junction City, Kansas.

The diagram of the whole study is shown as Figure 1. This study is comprised of three PARTS.

PART I is the general study of the Planned Unit Development. The purpose of the PART is to try to understand the new concept of PUD and then to apply this concept on the selected site for development.

PART II will mainly involve the site itself. The selected site will be evaluated and analyzed. The Site will be evaluated with the study of the development potential , Character of urban growth, accessibility to public service and the condition of the surrounding environment. The analysis of the site will include the soil, slopes, hydrography, vegetation, climatology, and aesthetic values. The purpose of all these evaluations and analyses is to understand the personality of the site, and the development suitability of the site,so that a guideline for later development for the site can be established.

PART III. will involve the analysis of the land uses for the site, and the landscape planning and design for the site.

The land use analysis is basically concerned with the decision on the types of use and linkanges between uses which will be located on the site.

The landscape planning and design will involve the planning concepts for the site and some criteria. At last a General Development Plan for the site will be presented as the result of the study.