

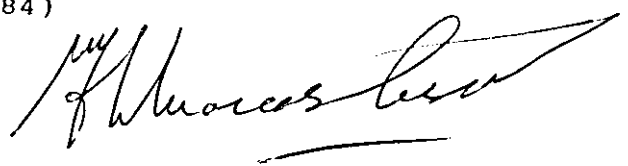
METHODS OF LAND-SUBDIVISION  
AND ITS INFLUENCE ON URBAN FORM  
( UMM AL-SUMMAQ AREA - AMMAN )

378118

H. N.  
F.V.C.

A Dissertation Submitted By:  
Abla Akram Sunna'  
B. Arch. (University of Jordan 1984)

Supervisors:  
Prof. Dr. F.N. Morcos-Asa'ad  
Dr. M. Tewfik



June, 28, 1989.

Submitted in Partial Fulfilment of the  
Requirements for the Degree of:

Master of Science in Architecture (Urban Design)

at the Faculty of Graduate Studies  
University of Jordan

ACKNOWLEDGMENTS

"And name it Gratitude, the word is poor".

"George Meredith."

To professor F. Morcos-Asa'ad for his valuable knowledge and precious time and effort.

To Dr. M. Tewfik for his helpful comments and advice.

To my parents for their continuous encouragement and enthusiastic support.

TABLE OF CONTENTS

ACKNOWLEDGMENTS . . . . .	ii
TABLE OF CONTENTS . . . . .	iii
ABSTRACT . . . . .	vi
INTRODUCTION . . . . .	1
i. Background . . . . .	1
ii. Hypotheses and objectives of research . . . . .	2
iii. Scope and Methodology . . . . .	2
Chapter 1: LAND-SUBDIVISION PATTERNS . . . . .	5
1.1. City patterns of Ancient times . . . . .	6
1.2. Classical City Patterns . . . . .	9
1.3. The Medieval city Patterns . . . . .	12
1.4. Islamic City Patterns . . . . .	14
1.5. Ideal City Patterns . . . . .	18
1.6. The eighteenth and nineteenth century Patterns . . . . .	20
1.7. Current land-subdivision Patterns . . . . .	22
1.8. Summary of chapter . . . . .	30
Chapter 2: URBAN GROWTH AND LAND POLICIES IN AMMAN . . . . .	35
2.1. The Urban growth of Amman . . . . .	35
2.2. Review of land policies in Amman . . . . .	44
2.2.1. Planning Controls and Procedures . . . . .	45
2.2.2. Land-Subdivision Procedures . . . . .	49
2.2.3. Land-Subdivision Ordinances . . . . .	51
2.3. Land ownership . . . . .	51
2.3.1. The Concept of land-ownership in history . . . . .	53
2.3.2. An overview of land-ownership in Amman . . . . .	55
2.3.3. Land tenure and types of ownership . . . . .	56

2.4. Land Values . . . . .	59
2.4.1. Land services . . . . .	60
2.4.2. Adjacent land-uses . . . . .	61
2.4.3. Land-subdivision regulations . . . . .	61
2.4.4. Land speculation . . . . .	63
2.5. Summary of chapter . . . . .	65
Chapter 3: DESIGN REQUIREMENTS FOR LAND-SUBDIVISION . . . . .	69
3.1. Background of land development . . . . .	69
3.1.1. Before World War I (The late nin- eteenth and early twentieth century) . . . . .	70
3.1.2. After World War I (The nineteen twen- ties to the fourties) . . . . .	73
3.2. Land-subdivision standards and design requirements . . . . .	76
3.2.1. Land-subdivision standards . . . . .	77
3.2.2. Current trends in land-subdivision design requirements . . . . .	88
3.3. Existing urban development and land- subdivision in Amman's residential areas . . . . .	98
3.3.1. Land-subdivision and development ordinances and controls . . . . .	100
3.3.2. Current problems associated with land-subdivision and development regulations . . . . .	102
3.4. The need for modified (Urban design) . . . . .	105
3.5. Summary of chapter . . . . .	109
Chapter 4: CASE STUDY: A RESIDENTIAL AREA IN UMM-AL-SUMMAQ, AMMAN . . . . .	114
4.1. Choosing the study area . . . . .	113
4.2. Site analysis of study area . . . . .	117
4.3. The current situation and associated problems . . . . .	122
4.4. Proposed Urban Design solution . . . . .	126
4.5. Compative evaluation between the existing and the proposed solutions . . . . .	130
4.6. Summary of chapter . . . . .	137

Chapter 5: CONCLUSIONS AND RECOMMENDATIONS . . . . .	140
5.1. Conclusions . . . . .	140
5.2. Recommendations . . . . .	142
BIBLIOGRAPHY . . . . .	144
APPENDICES . . . . .	149
Appendix I. : Low no. 79 of 1966 for Twon and Village Planning . . . . .	149
Appendix II. : Land-Subdivision Standards in 1950 and 1978 . . . . .	154
Appendix III.: Site Development Alternatives. . . . .	157
Appendix IV. : Design Solutions-prototypical Examples . . . . .	165
Appendix V. : A 1981 Study to re-adjust the current planning and building regulations . . . . .	170
ABSTRACT IN ARABIC . . . . .	173

A visual survey and site analysis is conducted in chapter 4, for an existing residential development in Umm-Al-Summaq area in Amman, and a proposal for an urban design solution is presented to satisfy both the modified land-subdivision standards and the design requirements. A comparative analysis between the proposed and existing solutions is undertaken illustrating that the recommended modified standards for land-subdivision assist in the enhancement of the visual and spatial environment.

Chapter 5 presents the research conclusions and recommendations verifying the original hypotheses and showing that methods of land-subdivision directly affect the residential developments, in urban areas, both visually and spatially.

## INTRODUCTION:

### 1. Background

The municipal authorities in any country have a planning procedure that is expressed through its zoning ordinances and land-subdivision regulations. These regulations are locally adopted laws governing the process of converting land into an urban development according to a pre-established land-use policy.

Land-subdivision regulations which became important after World War I were merely a new model of a very old device. The land-subdivision process was almost the same through history with minor changes; public or private developers were responsible for defining street lines and dividing the land into blocks and then into lots to facilitate its distribution among individual owners. This method of subdivision had great and direct effects on urban patterns of the built-environment and the quality of its open spaces.

Residential urban developments occupy about half of the urban land within Greater Amman area, which emphasizes the importance of residential land-subdivision methods in shaping the spatial qualities of the built-environment.

## ii. Hypotheses and objectives of research

The research aims to consider the impact of land-subdivision regulations on the urban design of residential areas in general. The study will discuss the theoretical bases and current research work undertaken, followed by an application of these criteria to a case study of the Engineers Housing, Umm Al-Summaq, Amman.

The study proposes to test within this broad objective the following hypotheses:

- 1- Zoning ordinances control the shape and size of blocks, land-uses, street hierarchies, open spaces and other community facilities, all of which result in a characteristic urban form.
- 2- Land-subdivision regulations control the lot size, hence they play a fundamental role in the way it is developed and in affecting urban design and the spatial qualities of open spaces.

## iii. Scope and Methodology

This study proposes to focus on the impacts of land-subdivision regulations on the physical and spatial forms of the residential built environment. Such impacts affect the intensity of development, land utilization, development cost and the whole urban spatial form and pattern of open spaces.



To fulfill the objectives and to test the previous mentioned hypotheses, this research undertaking will include the following:

1- Historical background of land-subdivision patterns, their interaction with the urban form and impacts on the formation of the current land-subdivision patterns.

2- Review of Amman's urban growth and the associated land policies. This study also includes land-subdivision ordinances and regulations and the prevailing types of land-ownership and tenure systems. Also a general review of the concept of land-subdivision in history.

3- Analysis of the design requirements and standards for land-subdivision in general and in Jordan. This study comprises evaluation of the current ordinances and controls from a social, economic, and spatial points of view.

4- Urban design guidelines with respect to elements affected by land-subdivision method will be given, leading to a proposal that help improve the physical and spatial pattern of the urban environment.

5- A study area in Umm-Al-Summaq will be analyzed (socio-economic, spatial and urban form context) and proposals made for an urban design solution based on the above mentioned guidelines with reference to efficient land-subdivision, use of open spaces and pedestrian and vehicular movements.

6- Conclusions will be drawn from the research undertaking and recommendations made for future research and investigation.

## Chapter 1:

### LAND-SUBDIVISION PATTERNS.

Throughout history the development of cities and its continuous remodelling was an indicator of the culture of its people. A city's physical form was shaped by the economic, social and political forces of its society and the continuous variations in its patterns were indicators to the changes in these dominating forces during the successive periods of history.

Most cities of ancient cultures were founded without a plan at first, merely according to the way of settlement chosen by its inhabitants. As they grew in size, irregular patterns were introduced in their development, which later was transformed to geometrical forms for sub-dividing the land between the settlers. For example, colonial cities were given a formal pattern by the ruling authority, while regular forms were used by the land owners in the medieval city for subdividing their land. Through time, the irregular and geometrical patterns had been superimposed one upon the other. Villages which grew into cities showed

geometrical forms super-imposed upon an irregular patterns, other cases showed irregular patterns being imposed upon cities having an original patterns of grid-iron streets (1).

One can trace two basic forms of towns: The walled town and the open city (2). Within these forms a wide variety of patterns existed where the relationships between the blocks, the way they fit together and with other urban activities was of the greatest impact on their forms. This can be shown through a brief survey of ancient civilizations. In reviewing the evolution of these patterns through history, lessons based on the experience of our ancestors are obtained which may lead to better solutions with regard to land-subdivision methods and procedures; this in turn, may have an impact on both the physical and spatial character of the built-environment.

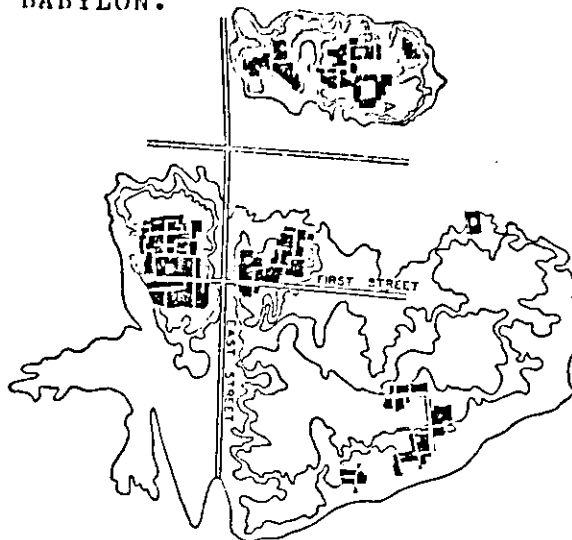
#### 1.1. City patterns of Ancient times.

The earliest civilizations began around 4000 B.C.(3) in the area known as the Fertile Crescent, "...which spread along the fertile valleys of the Nile, Tigris-Euphrates, and Indus rivers" (4). Along the

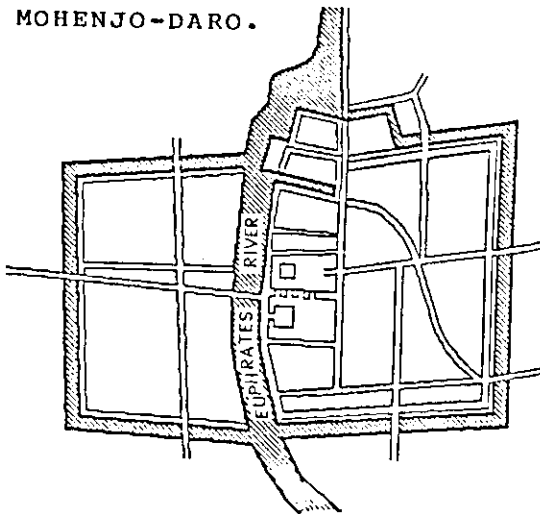
Tigris-Euphrates rivers, the earliest cities were built by Sumerians as both fortresses and market places, where the Ziggurat and public buildings dominated the center. The city of Babylon located 88 miles south of Bagdad was one of these earliest cities, which was built originally in the same manner, with the streets probably irregular. During the sixth century B.C., it was rebuilt following a regular street pattern while maintaining the location of the temple and tower at the center, (5) (Fig. 1.1-A).

In Egypt, about 3000 B.C., the cities were erected upon the orders of the pharaohs in regular patterns, where compacted cells were accessible by narrow alleys. These towns were built mainly to house both slaves and artisans involved in building the pyramids and which were abandoned later after their completion. One of the oldest cities was Kahun about 3000 B.C. which was built for the workers employed in the construction of the Illahun Pyramid. It followed a regular pattern, in which rectangular blocks arranged like cells of

A - CITY OF BABYLON.



B- CITY OF MOHENJO-DARO.



C- TOWN OF KAHUN.

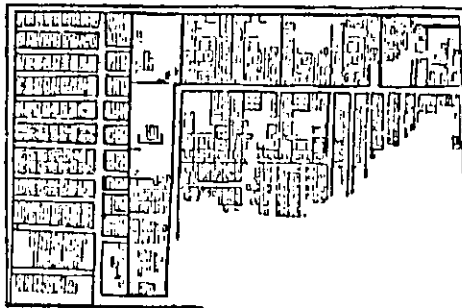
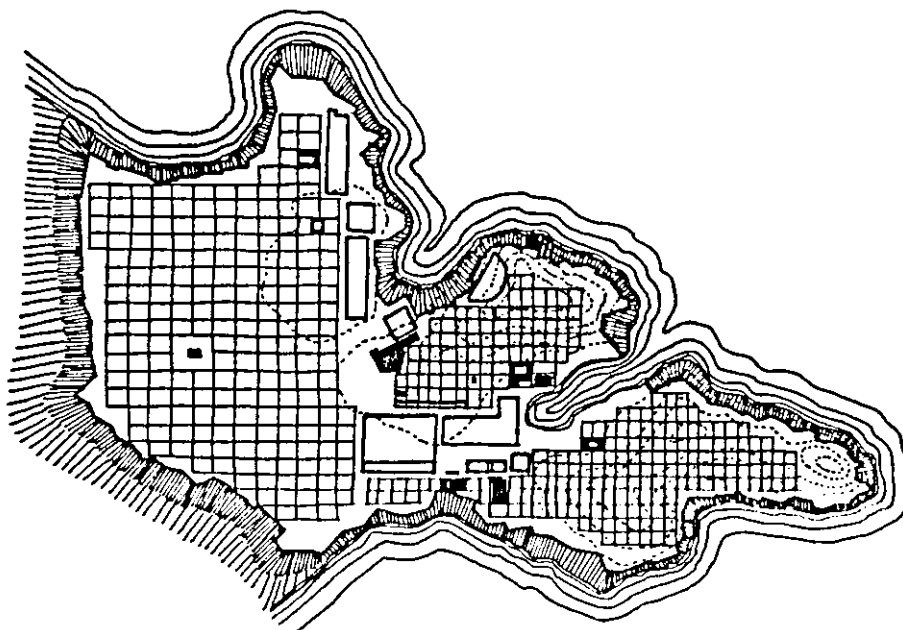


FIG.1.1. ANCIENT CITIES PATTERNS.  
 Source: Gallion and Eisner, The Urban Pattern

accordance with the establishment of democracy, where the individual's dwelling gained greater importance in the city fabric, and hence it was applied uniformly throughout the plan with no distinction between them. Unlike cities of ancient times the physical and spatial environmental qualities of the home is now a major aspect that should be taken into the design and layout of the urban built form considerations.

The Greeks superimposed the grid-iron pattern of street system upon the rugged topography of their sites creating some difficulty in accessibility along numerous streets. The city of Priene for example, fourth century B.C., was built on a regular plan with streets at right angles to each other and rectangular plots of equal sizes of 160 ft (48.8m) by 120 ft (36.6m), (10) (Fig. 1.2-B). The length or breadth of Greek town blocks (sometimes both) was usually 120 ft (36.6m).

A- MILETUS



B- PRIENE

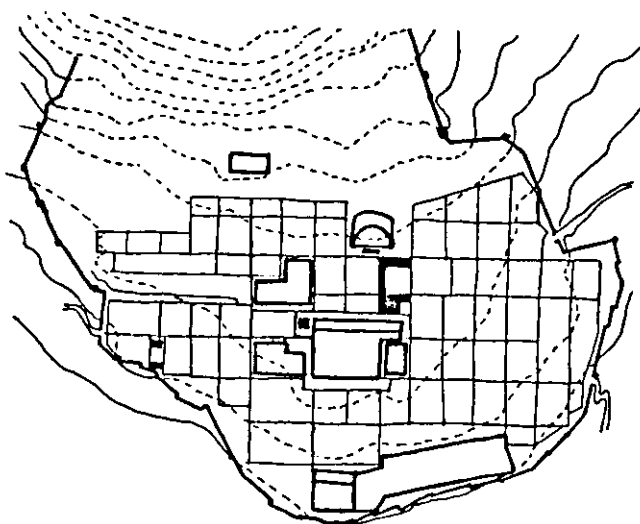


FIG. 1.2.  
Source:

GREEK CITIES PATTERNS.  
Rasmussen, Towns and Buildings

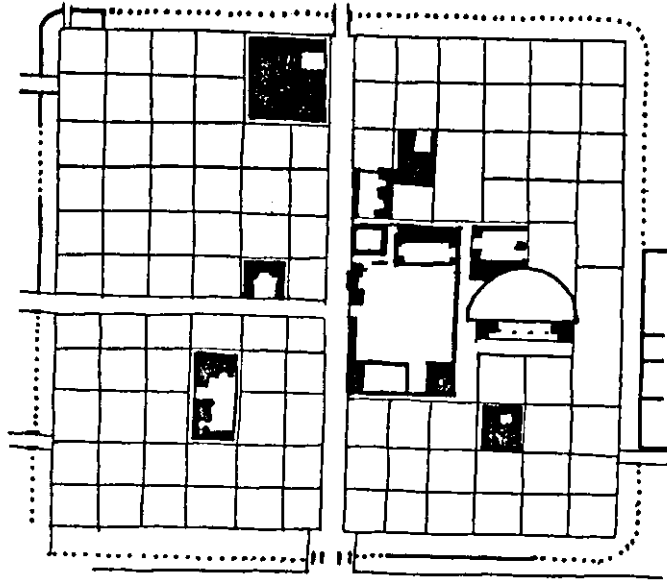


The Greek grid-iron pattern was transferred to the Romans, who imposed regular patterns upon the irregular patterns of their villages. Later on, the same regular system was applied for their new towns, known as "colonial towns", which they founded throughout their empire. The Roman town blocks was usually 120 ft. by 240 ft. (36.6m X 73m). These towns were garrison towns founded to guard important crossings in the conquered areas, like the city of Timgad in Algiers, (Fig. 1.3-A). They later formed the nuclei of thousands of European cities, like the city of Turin, (11) (Fig. 1.3-B).

### 1.3. The Medieval City Patterns.

Medieval cities had generally two patterns: The irregular pattern when growth was slow, and the regular pattern used for rapid erection of new towns. Medieval cities of the twelfth and thirteenth centuries were usually located on irregular terrain on hilltops, or islands for military purposes. During this period they adopted the irregular street pattern that fitted with the topography and which created spaces and circulation that was molded within it. It had two dominant

A- TIMJAD



B- TURIN

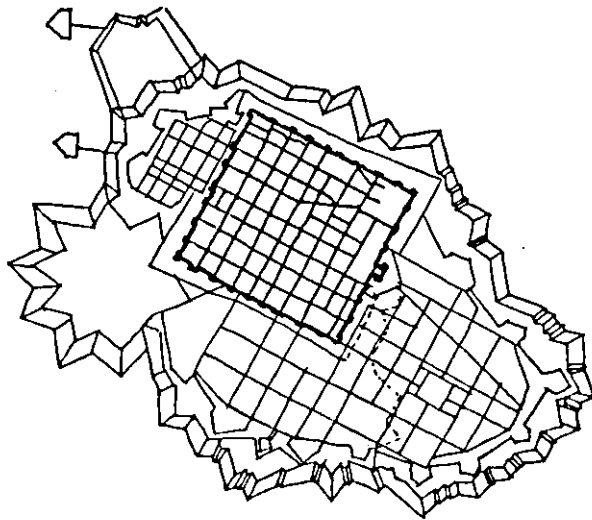


FIG. 1.3.  
Source:

ROMAN CITIES PATTERNS.  
CATANANESE, 'EVOLUTION AND TRENDS'  
Gallion and Eisner, The Urban Pattern

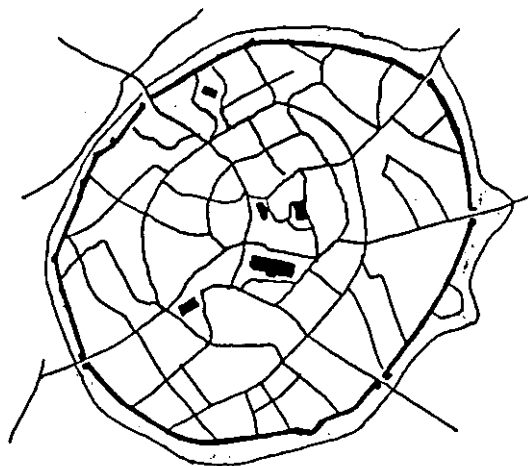
elements: the church and the lord's castle, representing the ruling forces at that time. Both leaders, the temporal and the spiritual, had the power to determine the sites for the new cities,(12) (Fig. 1.4-A).

Colonial cities were founded during the thirteenth and fourteenth centuries by young empires, mainly to protect their trades. They were based upon regular patterns varying from the square grid due to geographical conditions and whose basic element was the centrally located square,(13) (Fig. 1.4-B).

#### 1.4. Islamic city patterns.

Traditional Islamic cities were built for human-scale pedestrian movement (14). They comprised a well-established system of road hierarchy adapted to topography with a winding organic nature and emphasising the clear division between public and private spaces (15). Public streets were mainly three types: primary streets (major arteries, linking the center to city gates, major quarter streets, linking

A- NOERDLINGEN



B- MONTPAZIER

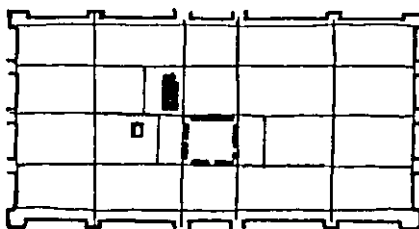


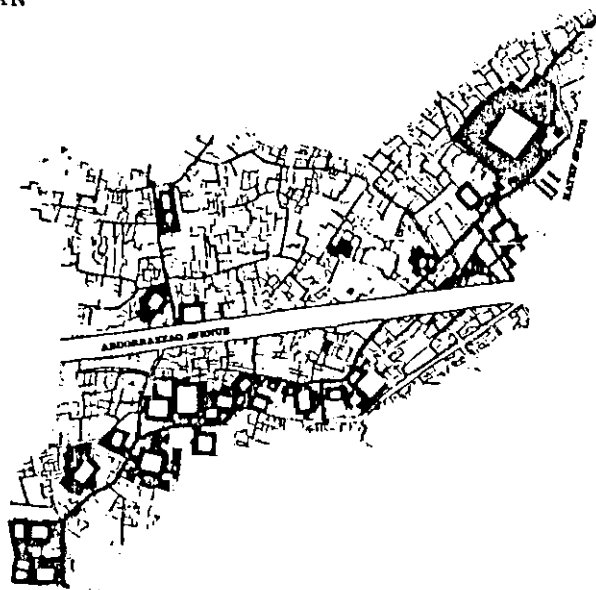
FIG. 1.4.  
Source:

MEDIEVAL CITIES PATTERNS.  
Gallion and Eisner, *The Urban Pattern*

the primary streets with adjacent quarters; and minor quarter streets (neighbourhood streets) which provided access to residential quarters. Private streets (cul-de-sac), gave access to clusters of private houses (16). This circulation network also acted as a communicating device in connecting all elements of the urban fabric, where the housing and access were of the primary concerns of land development and urban design principles (17).

In the nineteenth century, during the colonisation period, European-type cities with straight wide avenues were built next to existing old Islamic cities, such as in Cairo, Tunis, Fes, Aleppo, and Lahore. By the early part of the twentieth century, and the withdrawal of colonial powers, new approaches for the modernization of the old cities were adapted. An example of which is in Isfahan where modern roads were cut through the historic fabric of the old city in 1920s and 1930s (18), (Fig. 1.5-A) Another example is Aleppo, whose origins are Hellenic and Roman, with a regular pattern

A- ISFAHAN



B- ALEPPO

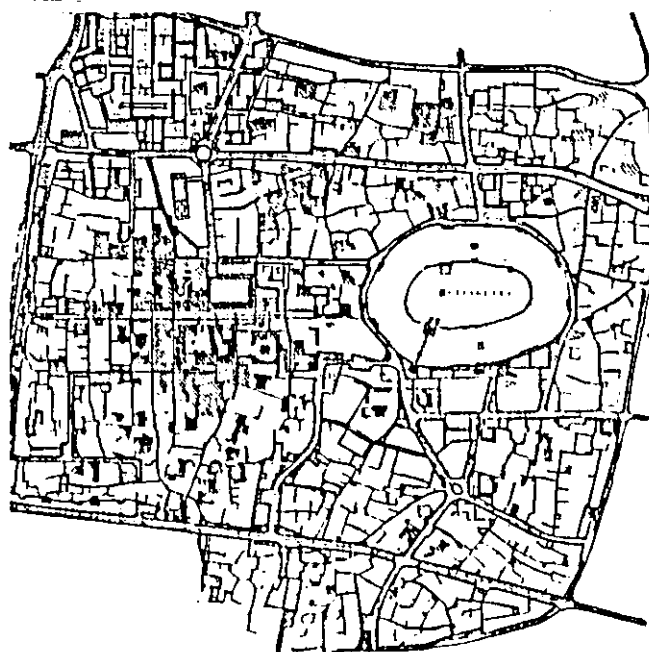
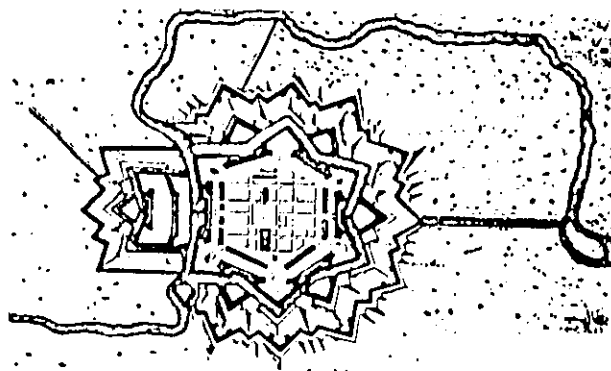
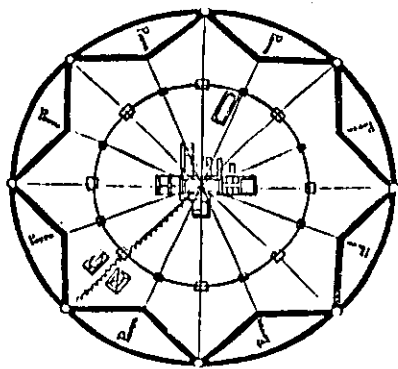


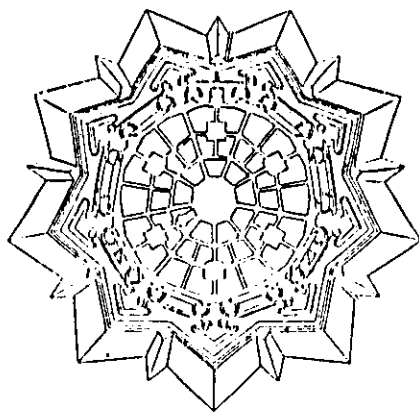
FIG. 1.5.  
Source:

ISLAMIC CITIES PATTERNS.  
Serageldin & El-Sadik, The Arab City. Its  
Character and Islamic cultural heritage,

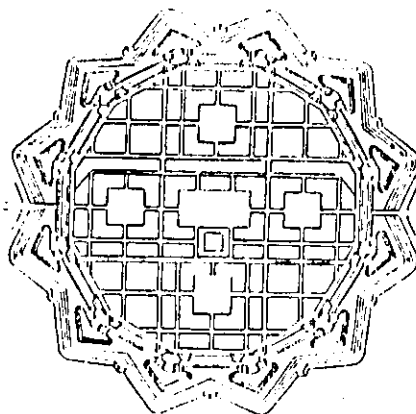


A- The Vitruvian schemes of the Renaissance

B- The geometrical logic of military engineering



C - Plan for an ideal city - from Buonaiuto Lorini: "Delle fortificatione libri cinque". Venezia 1592.



D - Plan for an ideal city from Vincenzo Scamozzi: "Dell'idea dell'architettura universale". Venezia 1615.

FIG. 1.6.  
Source:

IDEAL CITIES PATTERNS.  
Rasmussen, Towns and Buildings

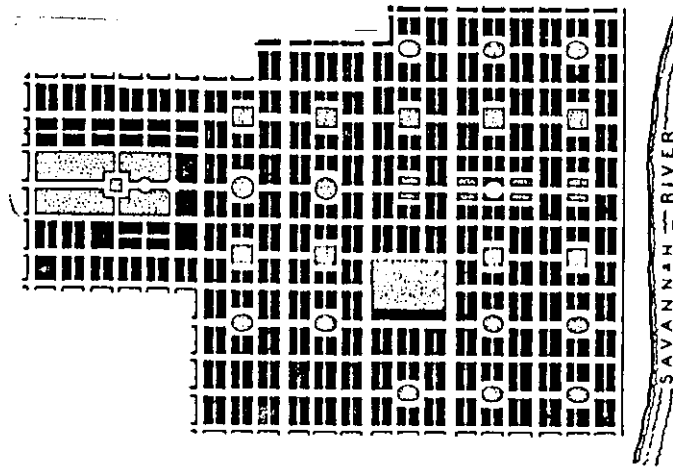
#### 1.6. The eighteenth and nineteenth century patterns.

The eighteenth century witnessed the beginning of the industrial movement and the rise of mass transportation. Thus, in the older parts of cities, a new network of streets was imposed upon the existing pattern causing grave incompatibility. Interest in the orthogonal grid (22) was renewed to solve the problems of road traffic particularly in new urban developments.

The orthogonal grid was also used in the nineteenth century in the American colonies, where the land was subdivided by a regular network of streets. An example of which is Savannah (23) in Georgia, one of the earliest colonies, in 1733, was laid on a rectilinear street plan, (Fig. 1.7-A). Washington D.C. was also based upon the grid-iron pattern of a one-mile module, later in 1791, diagonal and radial streets were superimposed on it (24), (Fig. 1.7-B) In Britain, however, the grid-iron was rarely used before 1660, where 300 years before in 1666, after the great fire of London, proposals for rebuilding part of London was based on an arrangement of focal points and radial



A- SAVANNAH



B- WASHINGTON D.C

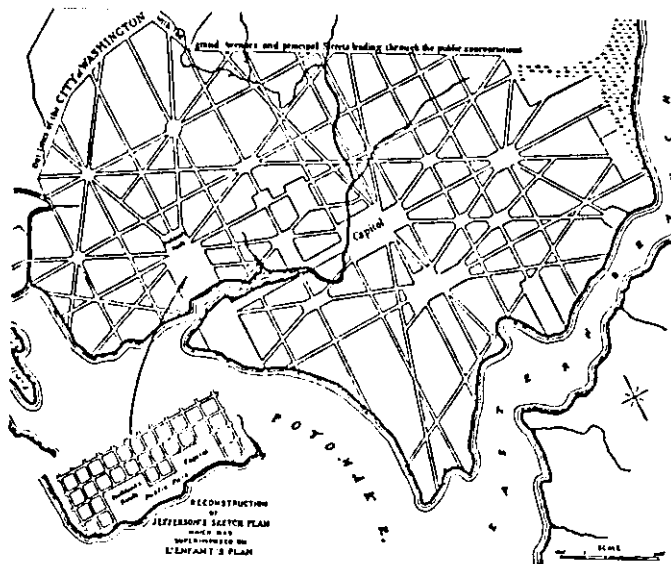


FIG. 1.7.  
Source:

EIGHTEENTH CENTURY PATTERNS.  
Lewis, Planning the Modern City. Vol.1  
Gallion and Eisner, The Urban Pattern

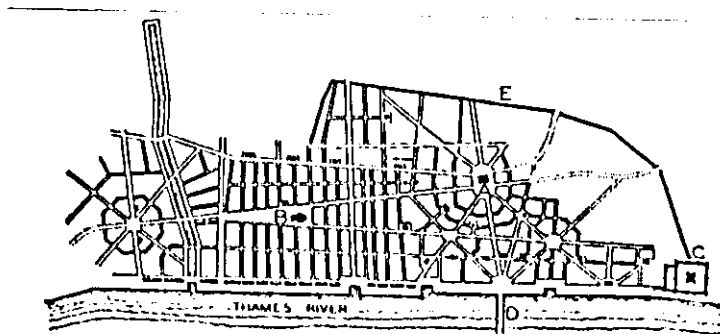
connections. Also in the replanning and construction of Paris, in 1853, a system of thoroughfares radiating from focal points was used (25) (Fig. 1.8-A,B).

### 1.7. Current Land-Subdivision Patterns.

After World War II, and as a result of the suburban sprawl due to congestion in city centres, and the increasing urban population, more lands were subdivided for development. This led to the growing need for land conservation and control, not only to avoid the waste of this valuable resource, but also for the economic and social stability of the whole community. Gallion and Eisner (26) wrote in 1963, "... The control of land subdivision has been similar to that of soil contamination. It is accepted only after most of the urban land has already been butchered into pieces that render our city the unhappy affair we now experience".

Land-subdivision standards for minimum lot area and frontage, streets, sidewalks, design and construction of pavements, water and sewer connections, are controlled by the local authorities. These

A- LONDON (Christopher Wren's Plan)



B- PARIS

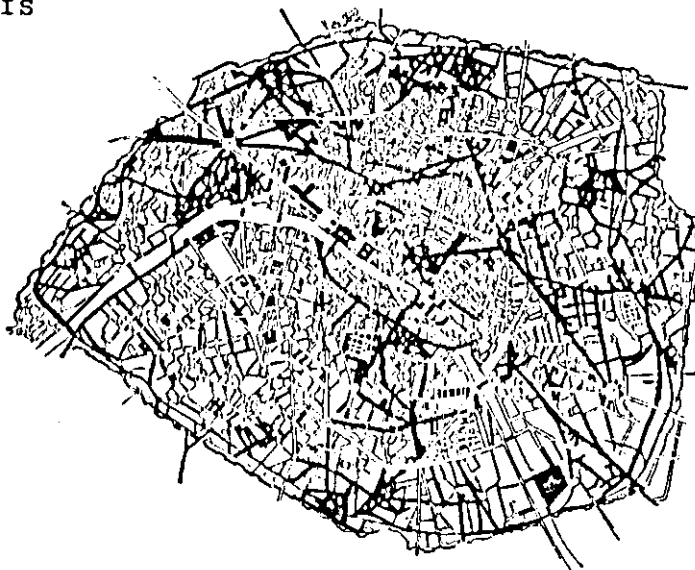


FIG.1.8. EIGHTEENTH AND NINETEENTH CENTURY PATTERNS.  
 Source: - Gallion and Eisner, The Urban Pattern.  
 - RASMUSSEN, TOWNS AND BUILDINGS.

authorities were subjected to economic and social pressures due to shortage in housing and the high cost of land, combined with their policy of minimal standards and reductions. This whole situation asked for a new land-subdivision controls to search for a "pattern of urbanism" (27), that would be appropriate to our time. These policies may be summarized as follow:

1- The Neighbourhood and park policy.

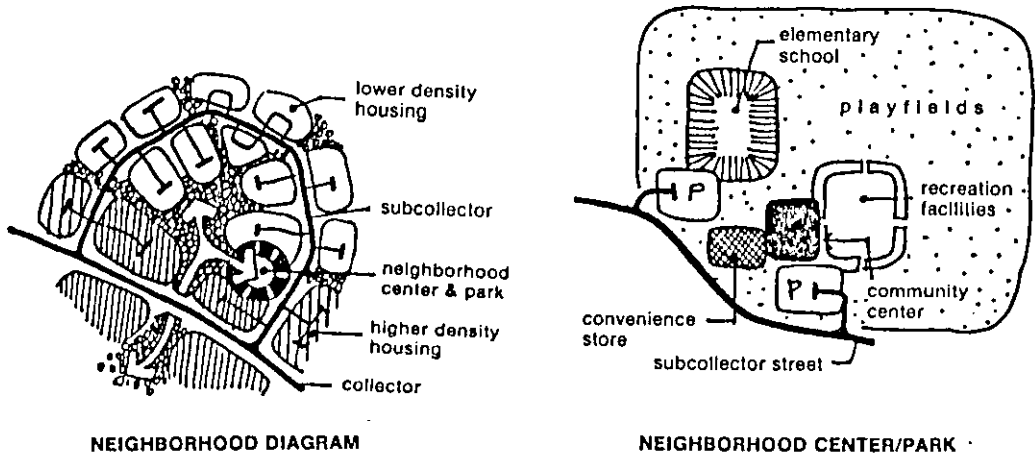
One of the policies that was adopted in a number of cities, was that any newly developed residential land must be provided with a neighbourhood park and playground. This neighbourhood and park policy (28) was based on the theory that the recreation space which serves a residential subdivision is of the same importance as streets, sidewalks, parking spaces and service roads (Fig. 1.9-A).

2- The planned development policy (The community unit).

This policy concerns the location of new

neighbourhoods within a city's structure plan, when the city centre is reaching saturation and the pressure for expansion and growth towards peripheral communities is taking place. The location of the land area for expansion in the structural plan, is usually approximately defined as low density within the undeveloped areas of the city. This leads to the appearance of the planned development or community unit policy (29) for large-scale subdivisions which implements, "... a desirable mix of dwelling accommodations to serve the need of a balanced range of family sizes and preferences" (30).

An owner or group of owners may suggest a development plan with a variety of dwelling accommodations and community facilities, which can be adopted by the legislative body as the zoning plan for the whole area instead of the prevailing one. The community development policy was incorporated in zoning ordinances to afford a flexibility in planning



A - NEIGHBOURHOOD PARK POLICY.



B - PLANNED UNIT DEVELOPMENT PATTERN.

FIG. 1.9. CURRENT LAND-SUBDIVISION POLICIES.  
 Source: - NAHB, Cost effective site planning.  
 - Brogden, 'Site planning and Design'.

subdivisions. This provides a variety with harmony in dwelling types and frees future land-subdivision from the straight forward procedures. This may also help to provide a particular spatial character for each urban built environment, (Fig. 1.9-B).

### 3- The Density Control Policy.

The method of classifying land-uses according to building types goes back in history, when fine residential buildings were protected from any undesirable uses within their vicinity. Through time, the physical and spatial characters of the city were changed due to changes in the social and economic structures, also due to variation in family composition, characteristics and personal desires. People began to need spaces in proportion to their family size and ages. This led to the need for a variety of building types to satisfy the range of desires and needs of families. This was accomplished by employing the density as a control policy (31) for residential subdivisions, instead of the type of dwelling, in order to establish the amount of land needed per family.

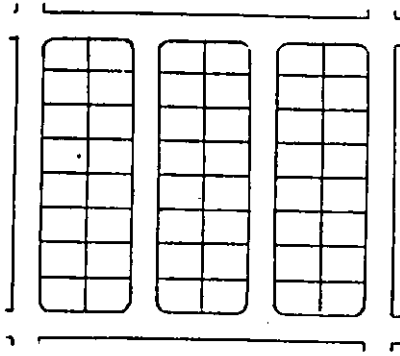


Fig. 1

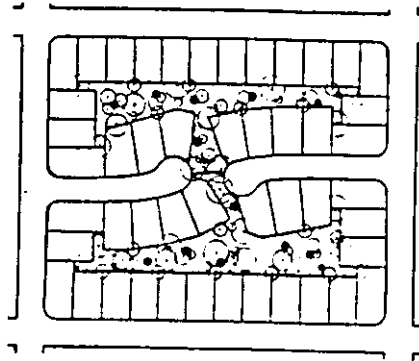


Fig. 2

*Density control. In this illustration Figure 1 represents a typical subdivision of forty-eight lots controlled by the minimum lot size. In Figure 2 relaxation of the minimum lot size as the basic control results in the same number of lots but reduces the area of internal streets, eliminates through traffic, and provides a common open space for all dwellings. It introduces a diversification in streets and an increase of recreation space.*

Fig. 1.10

DENSITY CONTROL POLICY.

Source:

Gallion and Eisner, The Urban Pattern



### 1.8. Summary of chapter.

The orthogonal grid for division and land parcelling by the rectangle, was the dominant device throughout history. The rectilinear subdivision system was used for different purposes, e.g. colonisation, speculation, town expansion and town improvements. The same device was used later in cities founded in the nineteenth century.

After World War II, a number of policies, shaped by land-subdivision controls, emerged in order to improve the urban environment, mainly using the minimum lot area and frontage as constraints. These policies were not without faults, and many urban spatial problems resulted. New policies were then developed, mainly the neighbourhood and park policy, the planned development and the density control policy.

Density control policy, where the number of dwellings per area of land is controlled, can be regarded as a key for improving land-subdivision methods. It is a measure which can help establish a

balance among community facilities, circulation and dwelling types. This in turn may affect the physical pattern and the spatial form of the urban built-environment of residential areas.

References of Chapter:

1. Arthur Gallion and Simon Eisner, The Urban Pattern (New York: DVN Company, 1963), P.4.
2. Ibid.
3. Anthony Catanese, 'Evolution and Trends', in Anthony Catanese and James Snyder, editors, Urban Planning (New York: McGraw-Hill Book Company, 1988), P.4.
4. Gallion and Eisner, The Urban Pattern, P.5.
5. Catanese, 'Evolution and Trends', P.4.
6. Ibid., P.4.
7. Sir Banister Fletcher's, A history of Architecture (London: Athlone press, 1975), P.41.
8. Gallion and Eisner, The Urban Pattern, P.6-9.
9. Steen Eiler Rasmussen, Towns and Buildings (Massachusetts: the MIT Press, 1951), P.9-10.

10. Ibid., P.11.
11. Evans Houghton, Architecture and Urban Design (London: the construction press, 1978), P.75.
12. Rasmussen, Towns and Buildings, P.16.
13. Gallion and Eisner, The Urban Pattern, P.34.
14. Setefano Bianca, 'Traditional Muslim Cities and Western Planning Ideology: An Outline of Structural conflicts', in Ismail Serageldin and Samir El-Sadek, editors, The Arab City. Its character and Islamic Heritage (Riyadh: AUDI, 1982), P.42.
15. Samir Abdulac, 'The Relevance of Traditional Muslim Housing Designs for contemporary Arab City Plannig', P.299.
16. Besim Hakim, Arabic-Islamic Cities, Building and Planning Principles (London: KPI, 1986), P.64.
17. Ibid., P.1.
18. Sherban Cantacuzino, 'From Courtyard to Street: Recent changes in the Pattern of Arab Cities', P.88.

19. Ibid., P.85, 90.
20. Houghton, Architecture and Urban Design, P.24.
21. Rasmussen, Towns and Buildings, P.23.
22. Catanese, 'Evolution and Trends', P.13.
23. Lewis Harold, Planning the Modern City. Vol.1 (New York: Wiley, 1975), P.120.
24. Ibid., P.125.
25. Ibid., P.122,123,128,
26. Gallion and Eisner, The Urban Pattern, P.229.
27. Ibid., P.242.
28. Ibid.
29. Ibid., P.242-243.
30. Ibid., P.247.
31. Ibid., P.243-249.

## Chapter 2:

### URBAN GROWTH AND LAND POLICIES IN AMMAN

Amman is the capital of the Hashemite Kingdom of Jordan, with a population of about 1,320,000 inhabitants (1) and it covers an area of about 528 sq.km. (2).

Historically, Amman had been settled since about 8000 years B.C. (3), however, the beginning of the city as an urban settlement dates back to the year 1200 B.c. at the time of Ammonites when it was their capital city: Rabbat Ammoun. The city was located at the site of Jabal Al-Qala'a and Seil Amman, and was divided in two parts: the upper city where the ruler lived and the administrative buildings were founded; and the lower city where daily agricultural and commercial activities took place (4).

#### 2.1. The Urban Growth of Amman:

In the 7th century B.C. Amman witnessed a series of occupations which started with the Assyrians, the

Babylonians followed in the 6th century B.C., the Persians in the 5th century B.C., and the Greeks in the 4th century B.C.. A new city was built then, on the ruins of the old one and was named Philadelphia. By the beginning of the Roman era, in the first century A.D., the region enjoyed a period of prosperity marked by an increase in building operations and town settlements (5).

The Islamic period (A.D.630-1099), was followed by the Crusader period (A.D. 1099-1268), the Mameluke period (A.D. 1268-1516) and then the Ottoman period (AD 1516-1918) (6). During the 400 years of Ottoman domination, the city sank into a state of stagnation and Amman retreated to the state of a small village, where sheep and camels grazed around the waters of Seil Amman (7).

Toward the end of the nineteenth century, in 1878, the situation was altered when the Circassian tribes began to settle in the ancient site of Amman, on the southern side of Jabal Al-Qala'a. They started by using

the ancient ruins as their homes, after which they built their own shelters using the available stones from the ruins on site (8).

Migrants from Sult and Ma'daba, also immigrants from nearby cities, such as Damascus, Nablus, Jerusalem, and Yafa came to Amman by 1895 to work in agriculture and commerce (9). This caused an increase in population and the built area developed in a ribbon manner along crowded road fronts without any previously prepared plans. Thus, Amman as a Circassian type village grew along the sides of the Tell. Small houses surrounded by boundary walls were the dominant ones as most of the land was used for agricultural purposes. When the Hejaz-railway reached Jordan in 1903, linking Damascus with Mecca, Amman grew in importance.

Amman began to redefine its political as well as physical prominence as the capital city when the Emirate of Trans-Jordan was established in 1923 (10), under the leadership of king Abdullah. Migrants from the surrounding countryside came to the new capital for



work. However, Amman remained small both in land area and in size of population. By the end of World War II, Amman's inhabitants were still concentrated along the seasonal river with a total number of 56,000 inhabitants on 2,600 dunums (1 dunum=1000 sq.m.) of land with a density of 22.4 persons per dunum (11). [(Table 2.1), (Fig. 2.1)].







Amman's growth until 1948 was normal and gradual as it spread along the Sult road to the north and Wadi-Es-Sir road to the west. Its urban built-up area included Jabal Amman, Jabal El-Weibdeh and Jabal Al-Qala'a. The period between 1948-1953, witnessed a rapid growth in Amman due to the natural increase in population and the large migration after the Arab-Israeli conflicts. Amman's inhabitants doubled to 115,000 with a density of 25.0 persons per dunum (12), [(Table 2.1), (Fig. 2.1)].

During the next nine years (1953-1962), the growth of Amman followed the previously established patterns along the Sult road and the Wadi Es-Sir road. i.e.

## MUNICIPALITY BOUNDARIES

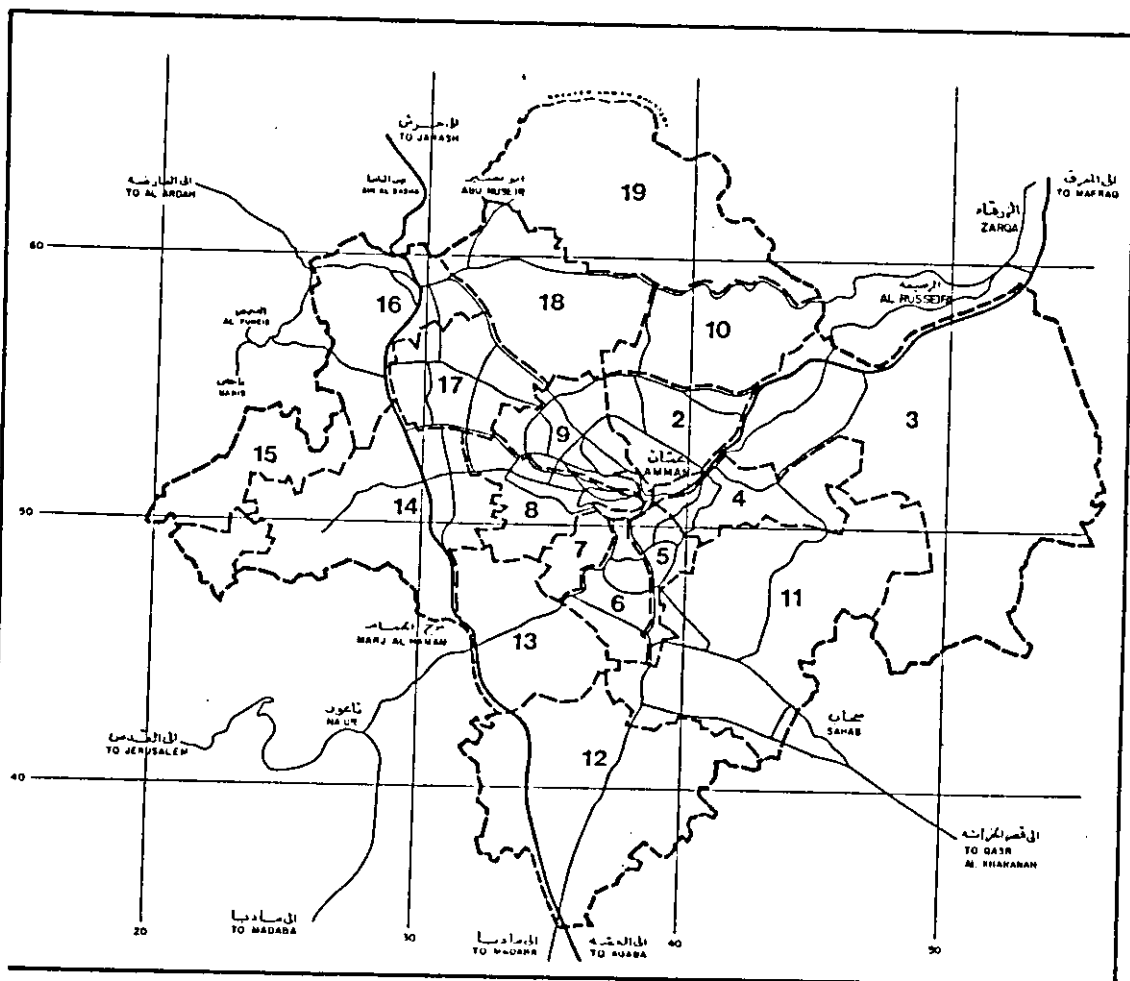
The area was in two parts, the first was on the place of the present city center, the other part was in the railway station's area.



	1925-1935
	1936-1948
	1949-1958
	1959-1972
	1973-1986
	1987- now

The urban expansion for the upper income groups took place mostly between Wadi Es-sir and Umm-Uthaynah districts of Amman, also between Jabal Hussein and Sweileh. The new developments consisted mainly of isolated four to five story structures, occupying over 40 percent of their plot areas. Furthermore, as a result of this rapid expansion the city's average density dropped to 19.1 persons per dunum, while at the large areas occupied by low income groups, the density increased from about 40 to 75 persons per dunum. This high density may be explained as due to high land prices and the planning regulations restrictions (14).

The Municipality of Greater Amman was formed in 1987, with a population of about one million, covering an area of 528 square Kilometers of both urban and rural land. It combined 14 existing municipalities and 11 previous village councils into 20 new districts under the co-ordinating authority of the Greater Amman Council (Table 2.2). The new boundaries of Greater Amman bring together communities of related economic and social concerns and where the land area is



Municipalities

1. Amman
2. Wadi El Sir
3. Sweileh
4. Qweismeh & Juweideh
6. Al Jubeiha
6. Tila'a Al Ali
7. Khuraybat El Suq & Jawa
8. Tariq
9. Abu Alanda
10. Umm Quseir & Muqablein
11. Badr
12. Umm El Summaq & Khilda
13. Al Yadoudeh
14. Shafa Badran

Village Councils

1. El Ragib
2. El Taybeh
3. El Bunayat
4. El Salhiyat
5. El Rabahiyah
6. El Deir
7. Dabouq
8. El Na'ur
9. Yajouz & El Kom
10. Marj El Fares
11. Bassah

Table 2.2. MUNICIPALITIES AND VILLAGE COUNCILS WITHIN GREATER AMMAN.

Source: Greater Amman Comprehensive Development Plan

sufficient for future growth and urban needs, (15)  
(Table 2.1).

## 2.2. Review of Land Policies In Amman.

The first attempt to develop a land policy for Amman was in 1949. The scope of the policy was restricted mainly to the planning of "King Faisal I plaza" street (16). Another effort in 1956 was to provide the city of Amman with a basic plan for the existing buildings, a policy for land parcelling and transport routing, all within the central area (17).

In 1968, as part of the "Five year National Development Plan" an United Nations expert prepared a proposal, which aimed to control Amman's physical growth by providing guidelines for development. One of its major issues was the land-use distribution in urban areas (18).

The "Amman Urban Region Planning Group" with the cooperation of "US.AID. Agency" prepared, in 1977, a comprehensive scheme to upgrade Amman's various services. Its main aim was to solve the existing

### Stage ii) The Structural development plan

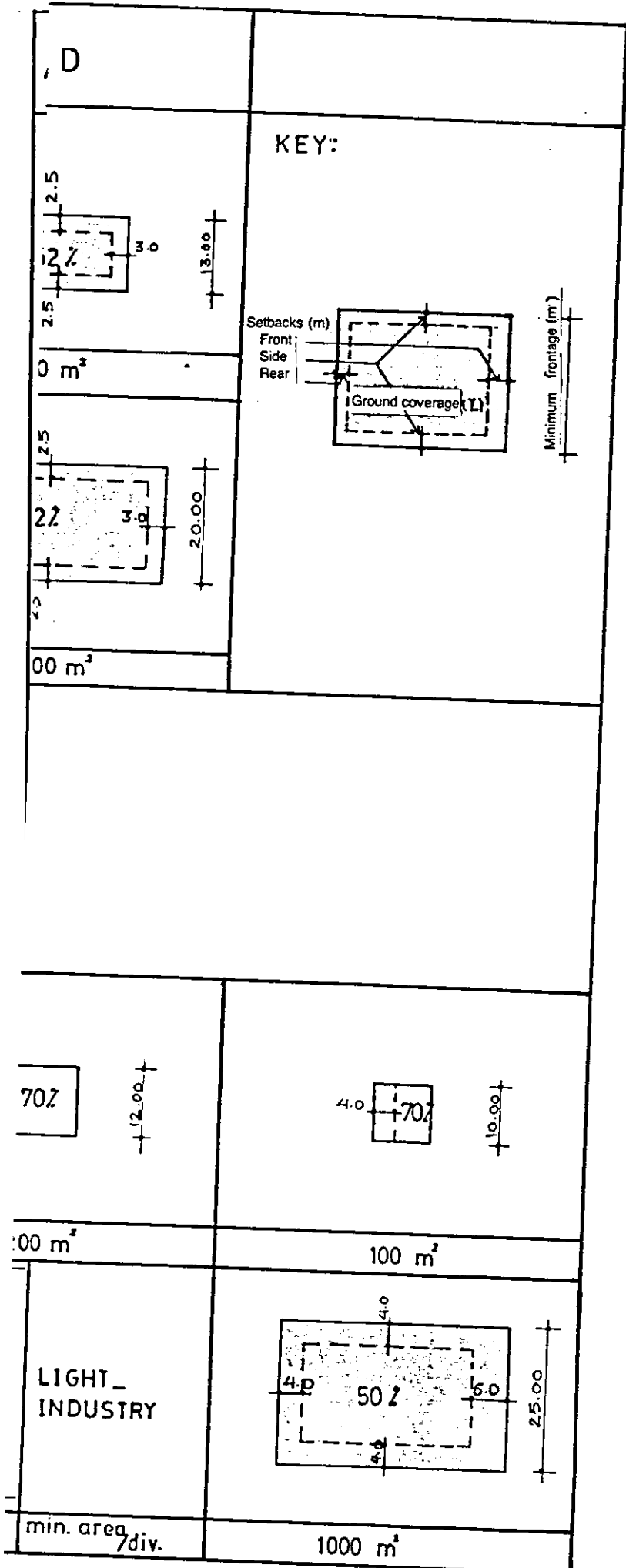
After the regional development plan is approved, the structural development plan (25) is prepared containing: the location of different land-uses, infrastructure, road-hierarchy. This is accompanied by a series of building regulations, land-subdivision ordinances including minimum plot areas.

### Stage iii) Detailed development plans

After the structural development plan is approved, any area become ready for development by providing a detailed development plan (26) for approval where all buildings and road locations are shown. Each development plan is accompanied by regulations and ordinances that are considered part of it, and which deal with land-uses, densities, land parcelling and subdivisions.

#### 2.2.2. Land-Subdivision procedures.

After progress through the planning procedures, the land is ready for subdivision consideration and



social, cultural, educational, financial and living standards. This was reflected in changes in the concept of land-ownership, where land (29) was transformed gradually from being a place for living and cultivating food for survival to become a commodity of a considerable value. Whereby, the way the land is developed, used and subdivided was affected as a result, which in its turn was reflected in changing the whole urban form of man's environment. This can be shown through a brief look to the forms of land-ownership.

#### 2.3.1. The concept of land-ownership in history

Historically land-ownership passed through various stages till it reached the current prevailing forms, where land is owned by one or more persons, by public or private companies, by the government, or by religious organizations. The form of land-ownership has a direct bearing on the approach of the client to land-subdivision and its prospective development.



The history of land-ownership dates back to the time when man lived in tribal groupings (30). Each group occupied the land on which they lived, and used its natural resources for their daily survival. The tribe defended its territory against the attacks of other tribes, while allowing equal right of use of land to all members of their own community. For the land belonged to the whole community and not to the individual. When a tribe grew in size its settlement was subdivided into villages, but the land remained as a community holding.

This tribal concept of land-ownership by the community was later changed to a feudal system, where the king or the head of state owned the land, and in turn bestowed it to the lords for their military support. These feudal lords employed slaves to work the land, and this led to the appearance of the term "landlord", since land in itself did not necessarily belong to the person who lived on it or worked it (31).

The need to possess land was gradually transformed from the act of having a place for living and

cultivating food crops for survival, to becoming a commodity, a property, which is an act of owning a parcel of land for private use (32). This concept was referred to as the "freehold", or as having "the title to the land".

As the population grew in size, an increase in demand for land appeared. This resulted in the sub-division of great estates, to be sold in parcels of different sizes. Land became a commodity bought and sold for profit. It became a base from which economic and social standing were evaluated. This led to the appearance of regulations for land-subdivision (33).

### 2.3.2 An overview of land-ownership in Amman.

The Amman area was originally settled in the Paleolithic age (200,000 - 8000 years B.C.) (34), by hunters who lived in caves and forests. In the Neolithic period (8000-4500 years B.C.) (35), when a major change from hunting and plant gathering to agriculture had occurred. Man resided in villages in the form of tribal groupings. The form of land-ownership at that time was of a collective

ownership type, which exists among the Bedouins till today. State and public land-ownership were introduced about the year 1200 B.C., at the time of the Ammonites. They established their capital city, Rabbat Ammoun, and the land was mainly owned by the state.

Except for the Bedouin tribes, the Amman area was almost abandoned for nearly 500 years, from the late 14th century to the late 19th century, (see section 2.1). When the Circassian tribes settled at Seil Amman in 1878, private land-ownership was reintroduced, besides the state land-ownership of the Ottomans.

### 2.3.3. Land tenure and types of ownership.

Land is considered a basic source of wealth in any community, which necessitated the existence of principles and legislations to govern its acquisition, utilization and transfer of ownership. The existing land tenure legislations in Jordan are based on the following (36):

1. Principles derived from the Islamic law or Shari'a.
2. Ottoman code and regulations that prevailed in the

latter half the nineteenth century.

3. Regulations inspired by the British mandate, aimed at establishing individual property rights and maximizing the right of foreigners to own real estates.
4. Legislation associated with post-World War II modernization efforts and new industrialization projects.
5. legislation derived from nearby countries.

Land tenure systems regulate the possession and transference of land, where they can be acquired and transferred legally by deed, inheritance, will, gift, and prescription. There are three major forms of land ownership in Amman:

1. Public ownership (Miri) (37) , which are state-owned land, belonging to the government. It also includes land designated for public use, such as road networks and public open spaces.
2. The Waqf (trust property), where the land is in trust ownership to charitable organizations,

religious orders or welfare societies. These lands and properties are called Waqf and are administered in Jordan by the Ministry of Awqaf and Islamic Religious Affairs.

3. Private ownership, where the land is owned by one person or a group of persons:-
  - a. Individual ownership (38) (mulk hurr), which is the most dominant form of land tenure in urban spaces. It refers to the land over which a person has full ownership rights.
  - b. Joint ownership, in which the land is owned by more than one person in partnership. This partnership may be of equal or unequal shares and duties.
  - c. Condominium (39), A new concept of joint ownership in urban areas, where the property is owned fully by its occupants, including all common elements of the project and the land. It is particularly common for multi-storey building development in Jordan, where each individual apartment is sold as a condominium. Thus, a buyer has full ownership of his/her apartment and shares in the ownership of all common spaces and the land.

## 2.4. Land Values:

The value of any parcel of urban land is mostly affected by the factors influencing the extent of its beneficial use for urban activities. These factors are mainly of two types (40):

A. Natural Factors: which are the local physical characteristics of the land, i.e. its topography and landscape, type of soil, geological formation and environmental qualities.

B. Man-made factors: Resulting from human interference in the natural environment and where they are introduced controlled by man. These factors can be summarized as follows(41):

- 1- Available services and their costs, i.e. water, electricity and gas supply, waste disposal, road access and communication links.
- 2- Type and intensity of use in neighbouring lands. and their social and economic level.
- 3- The prevailing controlling regulations and restrictions on land and its uses.
- 4- Market forces, e.g. supply and demand which invite needs to focus on particular parcels of urban land, an example of which is speculation.

#### 2.4.1 Land Services.

Land value is affected by the availability of land services (42) which includes:

- a. Utilities comprising water, electricity, gas, telephones, storm drainage system and sanitary sewers.
- b. City services which include, garbage services, schools, public transportation and police and fire departments.
- c. Road access and transportation network.
- d. Technical factors which include: soil, topography, drainage, site's orientation and micro-climate.

#### 2.4.2. Adjacent land-uses.

The type and intensity of use in neighbouring lands, their social and economic level, the rate of population growth and the amount of vehicular traffic volumes and pedestrian movements. All of which can influence the potentials and intensity for land development, even its type and shape. This, in turn, affects the land-value (43).

#### 2.4.3. Land-subdivision regulations:

Selling the subdivided land lots will result in increasing demand for the supporting urban infrastructure services, facilities and means of transportation needed to serve these new developments. These have the greatest impact on urban design and place a big burden on the city's urban structure as a whole. Land-subdivision regulations appeared to enable, control and regulate land-use and to limit the random subdivision of lands. They were based upon the principle that the community gives the individual the right to use and develop his land beneficially to him, without harm to the community at large and in accordance with certain conditions that cannot and should not be violated. These conditions contribute to the urban environmental structure within which any development may take place.

Land-subdivision regulations comprise the rules and standards which guide the conversion of a vacant land into lots that may be used for urban development (44). The placing of urban activities on different parcels of



land will affect the urban land shape, form the community movement pattern and affect the quality of its visual and spatial environment. These rules, generally, include the shape and size of lots, the types and width of streets, minimum frontages, the open spaces and other areas to be reserved for community facilities, (see section 2.2.3).

#### 2.4.4. Land speculation:

The roots of land speculations date back to the middle ages. The church at that time realised large economic benefits from its own lands, by parcelling some of it into small plots and selling them to be used as booths for religious purposes. The rest of the lands were of no directly realisable value and only buildings could be bought and sold. Land values at that time was measured by how arable the land was, otherwise it was worthless (45).

Large housing projects came into being with the beginning of the 19th century, with the main aim of providing the best returns for its owners. This is but one example of how land gained more value, and building-land lots became a commodity and formed the

bases of land speculation. That is, when the value of a lot is not affected directly by being held back from the market, as in the supply and demand theory, but can be kept for longer periods of time as a speculative venture, awaiting the greatest profit that can be achieved by holding on the property until the need for its intensive use arises, and where no other commodity offer such a possibility.

The land speculator became a feature, a person who can affect the development plan of any city. An example of that may be seen within the lands on the outskirts of Amman. For a long time they remained underutilized until a housing scheme or other project was built, as a result of which the whole area witnessed an urban development movement. Hence, the important role of the land speculator in affecting the form of the city and its urban development.

## 2.5. Summary of chapter:

The Amman area had been settled from ancient times. By the end of the nineteenth century, the Circassian tribes settled at the ancient site of Philadelphia around Seil Amman, from which the recent urban expansion took place. In 1923, the Emirate of Trans-Jordan was established under the leadership of king Abdullah, and Amman's urban growth was gradual till 1948. Land policies until then were absent from any legislation, except for the Ottoman code of 1895.

The period between 1948-1953, witnessed rapid growth in the population of Amman. Land policies to control Amman's growth was then gradually introduced to provide guidelines for its development. The latest policies are those included in the draft report of "Greater Amman Comprehensive Development Plan" (1985-2005), published in 1987.

The planning and land-subdivision controls and procedures in Jordan, stem mainly from the Municipalities law no. 29 of 1955, and Town and Village Planning law no. 79 of 1966. They state the procedures required for

urban development. Land-subdivision ordinances and procedures, planning and building regulations are itemized and defined. These regulations, beside the aspects of land-cost and land-speculation, are the main determinants of urban land values.

According to the Land Settlement law of 1933 there are five types of land-ownership in Jordan. They are the: State domain, Miri, Waqf, Tribal land, and Privately owned land. The private ownership may be individual, joint or condominium. The type and form of ownership affects the urban built-environment and the visual and spatial qualities of the development.

References of Chapter

- ١- عمان عاصمة الأردن ١٩٨٨ (عمان: أمانة عمان الكبرى ١٩٨٨) ، ص ٨٧ .
- 2- Dar Al-Handasa (For in conjunction with Amman Municipality), comprehensive development plan for Greater Amman 1985-2005, Pre-final draft, Amman, 1987), P.2.1.
- ٣- عمان عاصمة الأردن ١٩٨٨ ، ص ٢٥ .
- ٤- عمان عاصمة الأردن ١٩٨٨ ، ص ٢٦ .
- ٥- عمان عاصمة الأردن ١٩٨٨ ، ص ٢٨ - ٣٠ .
- 6- Christine Osborne, an insight and guide to Jordan, (London: Longman group limited, 1981), P.5.
- ٧- عمان عاصمة الاردن ١٩٨٨ ، ص ٣٧ .
- ٨- عمان عاصمة الاردن ١٩٨٨ ، ص ٤٨ .
- ٩- عمان عاصمة الاردن ١٩٨٨ ، ص ٥٢ .
10. AUPRG (For ministry of Municipal and Rural affairs), Planned Development in Amman-Balqa region, interim report, (Amman, 1979), P.III-3-4.
11. Ibid.
12. Ibid.
13. Ibid., P. III-3-5.
11. Ibid.
15. Ibid.

- ١٦ عمان عاصمة الأردن ١٩٨٨ ، ص ٢٩٢ .
- ١٧ غالب بقاعين ، "التجربة الأردنية في التخطيط التنموي" ، مجلة المهندس الأردني ، عدد ٢٦ ، ١٩٨٢ ، ص ٤ - ص ٧ (ص ٥) .
- ١٨ بقاعين ، "التجربة الأردنية في التخطيط التنموي" ، ص ٥ .
- ١٩ بقاعين ، "التجربة الأردنية في التخطيط التنموي" ، ص ٦ .
- ٢٠ عمان عاصمة الأردن ١٩٨٨ ، ص ٣١٠ .
- 21- Greater Amman comprehensive Development Plan (1987-2005) p.6.1.
- 22- Article 13 of law no. 79 of 1966.
- 23- Article 14 of law no. 79 of 1966.
- 24- Article 15 of law no. 79 of 1966.
- 25- Article 19 of law no. 79 of 1966.
- 26- Article 23 of law no. 79 of 1966.
- 27- Article 28,29 and 30 of law no. 79 of 1966.
- 28- Planning and Building regulations no. 67 of 1979 (Articles 29,30,31,33,34,35,40,41, and 45).
- 29- Gallion and Eisner, The Urban Pattern, P.239.
- 30- Ibid., P.229.
- 31- Ibid.
- 32- Ibid.
- 33- Ibid., P. 231.

- ٣٤- د. محمود خير ياسين ، "تاريخ الأردن عبر اشارة ما بين ٨٠٠٠ و ٦٠٠٠ ق.م" ،  
العمران ، عدد ٦٣ ، ١٩٧٧ ، (ص ٧٤ - ص ٨١) ، ص ٧٥ .
- ٣٥- د ياسين ، "تاريخ الأردن عبر اشارة ما بين ٨٠٠٠ و ٦٠٠٠ ق.م" ، ص ٧٦ .
- 36- Mona Serageldin, William Doebele and Kadri El-Araby, "Insights: Background to Housing in Islam", in the Aga-Khan award for Architecture, Housing Process and The Physical Form, 1979, P. 75.
- 37- Ibid., P. 83.
- 38- Ibid., P.78.
- 39- W. Paul O'mara, Residential Development Handbook (Washington D.C.: ULI, 1978), P.131.
- 40- George Banz, Elements of Urban Form (New York: McGraw-Hill book company, 1970), P.67.
- 41- Ibid.
- 42- Harvey Rabinowitz, 'Real Estate Development', in Anthony catanese and James Snyder, editors, Urban Planning (New York: McGraw-Hill Book company, 1988), P.246.
- 43- Ibid., P.244.
- 44- Davis Arnold, The Practice of Local Government Planning (Washington D.C.: ICMA, 1979), P. 395.
- 45- Rasmussen, Towns and Buildings, P. 172-173.

## Chapter 3:

### DESIGN REQUIREMENTS FOR LAND-SUBDIVISION:

Throughout history, the form of our cities was shaped mainly by building types and patterns, which are based on land-subdivision methods. Land-subdivision, that is, "... the act of splitting a tract of land into separate parcels" (1), was used from ancient times, for the purpose of permitting development to take place, for residential and non-residential uses.

It became evident that the relationships between dwelling units, the way they are organized to make neighbourhoods and the way they are related to other urban activities are of the greatest impact on the quality of the cities' life and their forms. These relations are mainly governed by land-subdivision regulations "... roads and buildings, even gardens, do not grow by themselves. They are shaped by someone's decision, ... " (2). As far<sup>as</sup> land-subdivision in Amman is concerned, the Local Municipal Council is considered to be the decision-maker.

#### 3.1. Background of land development.

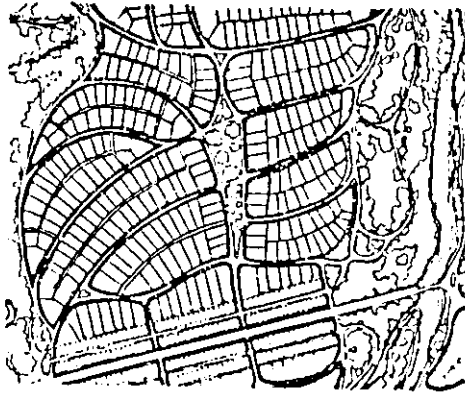
The pattern of streets and the subdivision of adjacent lands into lots, has been generally an



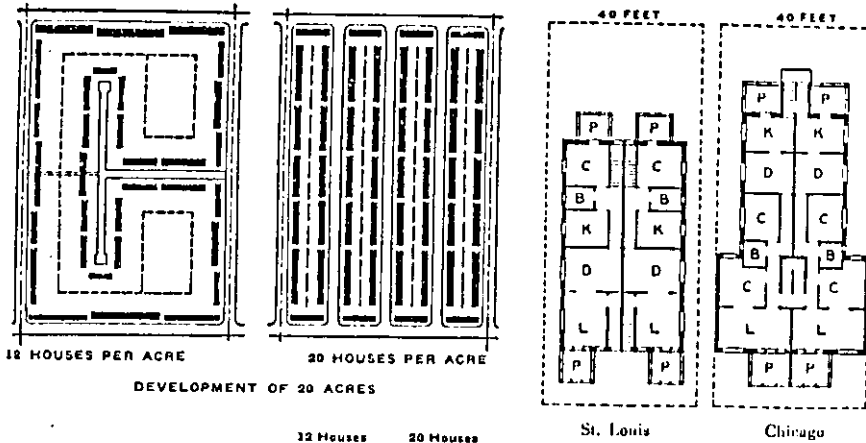
arbitrary extension of adjacent rectangular patterns based on the prevailing typical block and lot sizes or according to the developer to obtain greater number of lots out of his property. Theories dealing with elements of land-subdivision, that is block and lot layout and sizes, street types and requirements had emerged through history in order to enhance the urban environment of the city. This can be shown through a brief look at the history of land-development before and after World War I.

3.1.1. Before World War I (The late nineteenth and early twentieth century).

The layout of subdivision in most countries was the responsibility of the surveyor. At about the beginning of the twentieth century, the planner became involved with the appearance of large-scale residential subdivisions. These subdivisions were the result of increasing land cost resulting in the creation of residential communities at the outskirts of cities, and following a grid-iron street pattern. One of the earliest of these subdivisions was Riverside near Chicago, in 1869. Similar subdivisions followed later, after World War I, (3) (Fig. 3.1-A,B).



A- Olmsted's Plan for Riverside, LLInos (1869).  
Source: Davis, The form of housing, 1977.



	12 Houses to Acre	20 Houses to Acre
<b>AVERAGE FRONTAGE PER HOUSE</b>	21 ft.	21 ft.
Cost of raw land per acre	\$1,000	\$1,000
Cost of 40 ft. roads per yd.	\$51.25	\$51.25
Cost of 30 ft. roads per yd.	\$41.25	—
<b>NUMBER OF HOUSES</b>	240	400
Gross area	20 acres	20 acres
Area of roads	2.40 acres	4.70 acres
Net area	17.64 acres	15.24 acres
<b>AVERAGE SIZE OF PLOT</b>	353 sq. yds.	184 sq. yds.
Road frontage:		
40 ft. road	3,702 ft.	10,370 ft.
36 ft. road	2,162 ft.	—
<b>AVERAGE ROAD FRONTAGE PER HOUSE</b>	24.84 ft.	25.9 ft.
Total cost of land	\$20,000	\$20,000
Total cost of roads	\$16,750	\$20,375
Ave. cost of land per house	\$83	\$50
Ave. cost of roads per house	\$195	\$221
Ave. cost of roads and land per house	\$278	\$271
Cost per sq. yd. of plot	\$7.79	\$1.67
<b>GROUND RENT PER PLOT PER WEEK, AT 6%</b>	\$32	\$31

(From *Modern Housing*, by Catherine Bauer)

"NOTHING GAINED FROM OVERCROWDING"

B- TYPICAL FLAT PLANS DURING THE FIRST QUARTER OF THE TWENTIETH CENTURY

Early in the century Raymond Unwin wrote his treatise *Nothing Gained from Overcrowding*, in which he compared the typical subdivision street system with a more open development using the cul-de-sac street. In the United States, real estate development was taking the form shown in the photograph—a monotonous row of houses along street—and the single lot persisted with the building of individual "flat" buildings in the Middle-Western cities. These two-story buildings, with one apartment above the other and with most rooms facing a narrow side yard between the buildings, were reminiscent of the "dumbbell" tenements of New York.

Source: Gallion and Eisner, The Urban Pattern

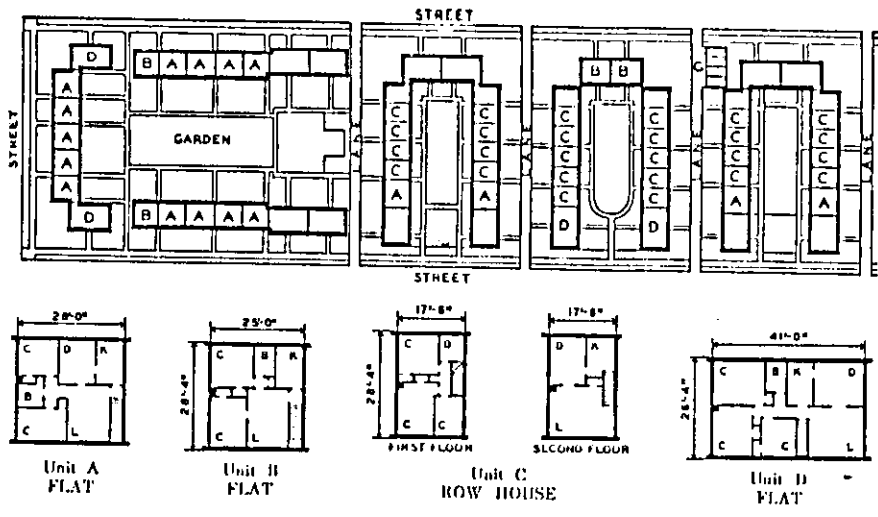
FIG. 3.1 RESIDENTIAL SUBDIVISIONS BEFORE WORLD WAR 1.

These residential subdivisions encouraged suburban expansion differing from those of previous subdivisions, in that they were only intended for the upper income groups. They were not planned and only the minimum improvements of infrastructure was made. This resulted in the deterioration of the suburbs, whereby as a result, local governments insisted that the subdividers must make certain improvements for development approval. These regulations later evolved into design controls to enhance the environment.

Although this suburban expansion was partially due to the increase in urban population, city centres remained populated and rental apartments became more common. The land-subdivision standards did change with the difference in income groups and lot's width of 40 ft (12.2m) and 50 ft (15.3m) replaced the lot's width of 25 ft. (7.63 m) which prevailed in the nineteenth century (4). The open spaces around buildings were also affected and their areas differed in accordance with the owner's income level. However, the main prevailing standard features in this period were maintained, such as the narrow interior courts, the side yards with minimum setbacks at the front and rear of the buildings.

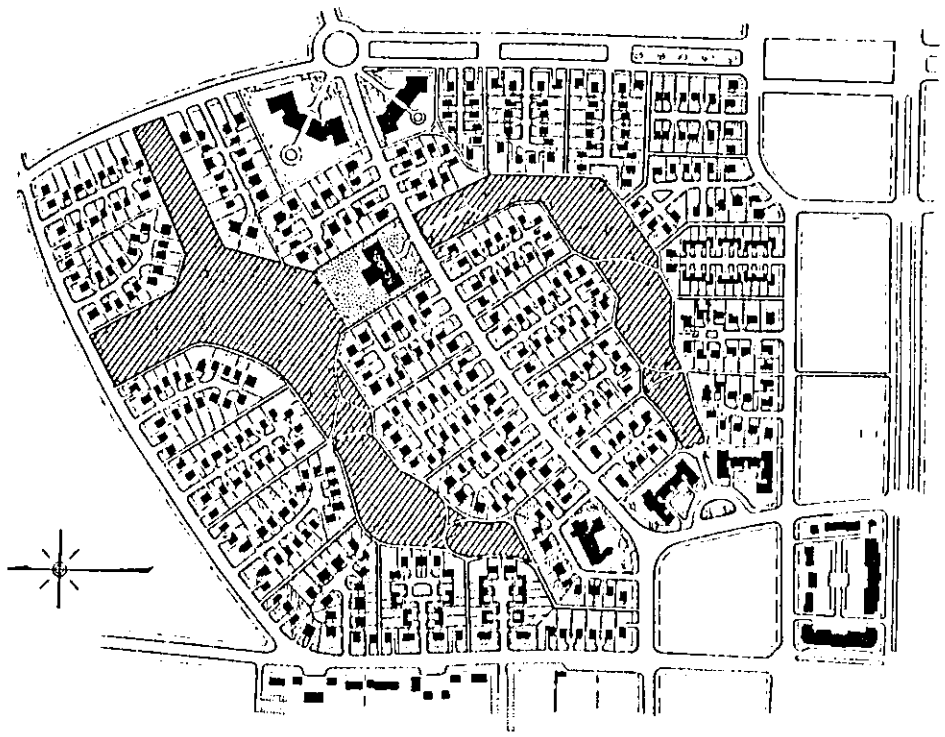
development by Henry Wright and Clarence Stein was the planning of the community of Radburn (8) (Fig. 3.2-B). The "Super-Blocks" of sizes ranging from 120 to 200 dunums were introduced, eliminating through traffic. The areas consisted of single-family houses arranged around cul-de-sac roads. Pathways provided a continuous pedestrian link leading to a large central, common open space. This type of development was called "The town for the Motor Age" and its residential character became a prototype for later residential developments.

The period during the nineteen twenties and early thirties, witnessed an evolution in the approach to residential developments, and although this did not solve the problems associated with land-subdivision, it did provide a base for future studies. The large-scale developments opened the opportunity for building arrangements, where the built-up area was reduced to 50 percent or less and the rest of the land was developed to enhance the environment and for recreational purposes. Twenty-five years prior to that, housing standards were completely disregarded for the sake of profit and the greedy exploitation of land, which produced high density housing with high lot coverage. The typical house before World War I, used to cover an



SUNNYSIDE GARDENS

Source: GALLION AND EISNER, THE URBAN PATTERN



RADBURN

SOURCE: BARNETT, AN INTRODUCTION TO URBAN DESIGN.

FIG. 3.2 RESIDENTIAL SUBDIVISIONS AFTER WORLD WAR 1.

area of 85 percent of the lot, with a narrow frontage and the deep lot was surrounded by either a paved traffic street or unused rear gardens with poor housing conditions (9).

After World War II, a number of development policies has emerged to enhance the physical and spatial environment which are: neighbourhood and park policy, planned development and density control policy. They are still in use today (see section 1.6).

### 3.2. Land-Subdivision standards and design requirements.

Zoning ordinances, in general, contain standards for lot sizes, dimensions and areas which differ from one zone to another. Before the late nineteenth century, lots in urban areas tended to be small of 25 ft. (6.3m) in width with a depth of 100 ft (30.5m) and 90% lot coverage (10). This pattern of development caused bad overcrowding conditions and called for improvements of the situation. After World War I, the land-subdivision standards were increased approximately to double that which previously existed (11).

A survey (12) made in 1930 showed that in cities of a minimum population of 500,000 inhabitants, the average lot was 38 ft. by 102 ft (11.6m X 31.1m) while in cities of 50,000 to 100,000 inhabitants, it was 45

ft. by 120 ft. (13.7m X 36.6m). The most common size found in several cities was 50 ft. by 100 ft. (15.3mX30.5m). However, because of the high cost of land and infrastructure, coupled with the desire of great profit, the current trends are to return back to the small plot subdivision standards.

### 3.2.1. Land-subdivision standards.

Land-subdivision is a technique for preparing the land for development. It requires the assistance and experience of qualified persons in different fields. Hence, different aspects should be studied before the land-subdivision phase, to produce an economical, efficient and well-fitted development. These aspects deal with land-uses, besides considering the structures in dividing the land, the means of access, the vehicular and pedestrian movements, the open spaces and the built-up areas. All of these, however, are governed by regulations dealing with the following elements:

- 1- Defining land-uses: where the area reserved for streets, recreation, services ... etc. depends mainly on the type of dwellings, net and gross density, as well as on the physical and spatial characteristics of the site. In general, areas reserved for non residential uses do not exceed 25 to 35 percent of the gross

area and in which the streets form about 20 percent (13).

2- Block size and arrangement: where the local building regulation, in general, has the greatest effect on the size and shape of the produced blocks. For example, some cities, for the sake of uniformity, apply rigid regulations requiring that new streets should continue the network of existing ones, beside applying the grid-iron pattern without any consideration for the topography. This type of regulations may produce blocks forced into a rigid pattern not desirable for use in residential areas.

According to Fritz Burns (14), the most desirable block patterns are those with dimensions ranging from 549m to 610m. However, Van Holt Garrett (15) points to the advantages of using long blocks to eliminate unnecessary cross streets, which may produce a saving of 20 percent in infrastructure cost. Recently, block requirements are determined by the suitable distance between streets in order to provide for an easy access from one area to another. Accordingly, block lengths (16) are generally not more than 1000ft. (305m) to



1200 ft. (366m) with cross streets provided at these intervals. When the block length exceeds 800ft.(244m), a pedestrian way should be provided through the block.

3- Lot size and shape: the minimum lot sizes and width for single-family houses are defined by local land-subdivision regulations, thus they may differ from one country to another and from one locality to the next. After World War II, lots standards were restricted to lots dimensions (length and width). John Mowbray (17) recommended the following lot sizes and shapes for housing layouts:

a. For a single family detached house, the best lot size is when the length is twice the width and that the most appropriate lot sizes are (18.3X36.6)m<sup>2</sup>, (22.9X45.8)m<sup>2</sup> and (30.5X61)m<sup>2</sup>. Mowbray further stated that while the most appropriate shape, in general, is the wide shallow lots, yet the cost of streets and infrastructure is higher than for the deep lots which are more appropriate to steep topography.

b. For single family row houses, the best lot size is 4.88m to 6.10m in width and a minimum depth of 27.4m to 30.5m.

However, Mowbray (18) stated that, "... In general the minimum size of a lot should be based upon securing

### Subdivision Lot Dimensions and Areas

(Size: lot dimensions and areas shall be no less than shown in the following table)

Type of Development	Sewer and Water Available	Public Water or Sewer Available	Neither Sewer nor Water Available
Single-family	60' frontage	70' frontage	100' frontage
Two-family	7,500 sq. ft.	10,000 sq. ft.	20,000 sq. ft.
Multifamily (4 families)	65' frontage	70' frontage	100' frontage
	8,000 sq. ft.	10,000 sq. ft.	20,000 sq. ft.
Multifamily (in excess of 4 families)	75' frontage	100' frontage	150' frontage
	10,000 sq. ft.	20,000 sq. ft.	30,000 sq. ft.

Source: Carleton, Michigan, Ordinances, etc., VILLAGE OF CARLETON SUBDIVISION REGULATIONS (Carleton: 1956), p. 3.

TO BE ESTABLISHED BY PLANNING COMMISSION  
ON BASIS OF POPULATION DENSITY

TABLE 3.1 CARLETON LOTS REQUIREMENTS.  
(according to available sanitary facilities).  
SOURCE: GOODMAN, PRINCIPLES AND PRACTICE OF URBAN PLANNING.

ample light, air, and driveway space, and upon fully meeting local customs and preferences". While Robert Gerholz (19) of Flint, Michigan emphasized the aspects of street cost and utility improvements in controlling the lot width for low and medium priced developments. Some cities (20) define lot requirements (lot dimensions and area) in accordance with the availability of sanitary facilities (Table 3.1). "J.C. Nichols (2) observes:" "Don't make the mistake of selling lots as narrow as 45 feet. We are now platting nothing less than 50 feet and are trying to hold a 60 foot minimum width for even the smallest house."

The basic current requirements of lots in land-subdivision regulations are compatible with zoning ordinances requirements, with respect to minimum allowable area and width. In general, the most acceptable minimum width is 60 foot (18.30m) and the minimum area is 6000 ft<sup>2</sup> (558.2m<sup>2</sup>) for single-family residential lots (22). The lots general requirements for land are as follow:

a. Lot lines:

Lot lines should be studied with regard to topography, the most favourable site for house location, usable land for front and rear gardens and the suitable grade

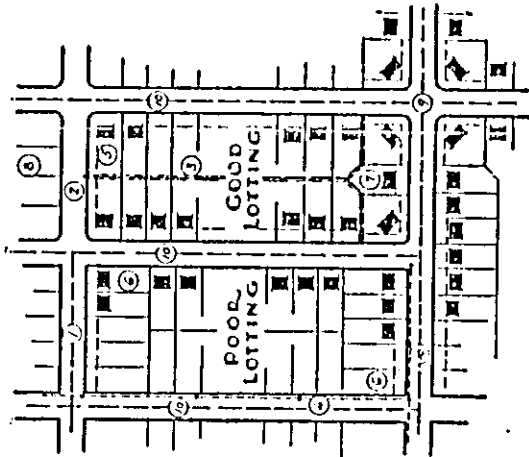
for driveways and garages. whereby, theories dealing with lot lines stated that (Fig. 3.3-A) (23):

- i) Side lot lines are required mainly to be at right angles to straight street and radial to curved street, except where topography dictates otherwise.
- ii) Rear lot lines should be straight; acute angles should be avoided, except where topography conditions require otherwise.
- iii) Odd-shaped lots are to be avoided for they are hard to sell.
- iv) Double frontage lots (through lots) are not desirable (24).
- v) streets that intersect at acute angles are to be avoided, for they produce poor shaped lots.

b. Lot's location:

- i) Butt lots, Charles Joern of Chicago (25) stated that, "... butt lots are not desirable or economical except where the ends of blocks face lot frontages across a street". In this case, the butt lot has the advantages of closing the views of the rear lot lines in these blocks (Fig. 3.3-A).
- ii) Corner lots, corner lot size should be 10 to 20 percent wider than those of interior lots to provide for adequate yard on the side street. An approximately

A-DIAGRAMS SHOWING GOOD AND POOR LOTTING PRACTICE.

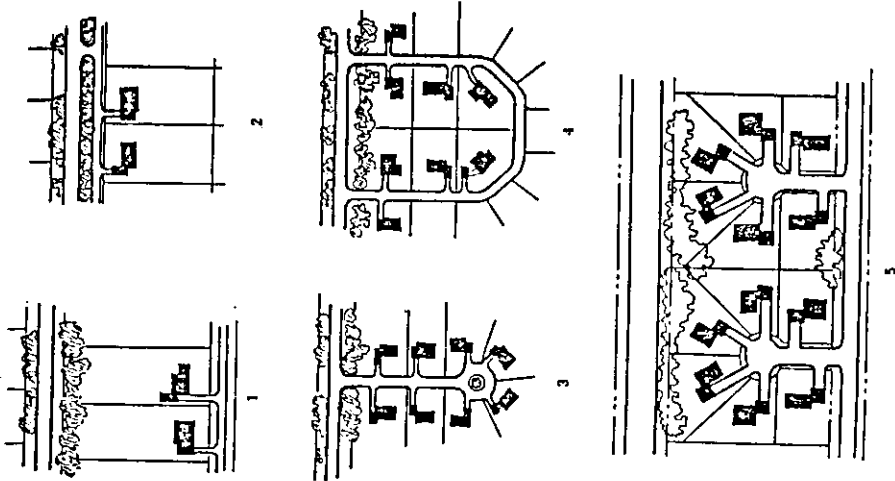


EXPLANATION

1. Excess underground utilities at end of block required.
2. No underground utilities at end of block.
3. Rear overhead utility easement.
4. Street overhead utilities.
5. Increased corner lot width.
6. Corner lots too narrow.
7. Good use of butt lot.
8. Butt lots require extra utilities with bad view down rear lot line.
9. Good lotting at street intersection.
10. Required underground utilities.

SOURCE: ULI, THE COMMUNITY BUILDERS HANDBOOK.

B-METHODS OF SUBDIVIDING ALONG A HEAVY TRAFFIC STREET.



Backing lots onto a street. 2. Using an access road. 3. Using a cul-de-sac opening off the collector. 4. Using a loop street. 5. Backing a cul-de-sac onto a collector.

FIG. 3.3. LOT LINES AND LOCATIONS STANDARDS. SOURCE: O'MARA, RESIDENTIAL DEVELOPMENT HANDBOOK.

square shape is recommended to provide an interesting grouping around the street intersection (26).

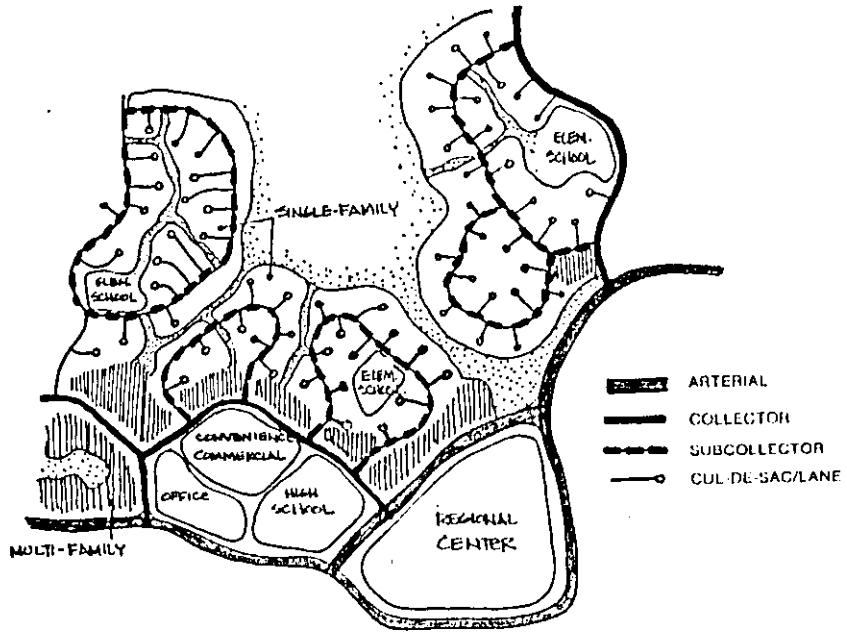
iii) Lots adjacent to traffic arteries, when the lots faces a heavy traffic street (27), several methods are suggested to protect the residential houses from noise and confusion and to create more desirable lots. These methods, in general, deal with keeping the number of individual lots accesses and street intersections to the minimum. Deep lots with houses backing on the high-traffic street screened by fences or walls and plantings can be used. Lots with houses facing toward the high-traffic street can be laid and screened by using a minimum of 6.1m wide strip of tree planting in between the traffic-way and a service street that gives access to the residential lots. Another alternative is the use of an additional setback with service access from the rear of lots, to avoid direct individual entrances on the high-traffic street. A short cul-de-sac or loop street extending from the high-traffic street, can also be used (Fig. 3.3-B).

However, it is important to note that all of the previously mentioned land-subdivision standards concerning lotting did not change during the last 28 years. (see Appendix II).

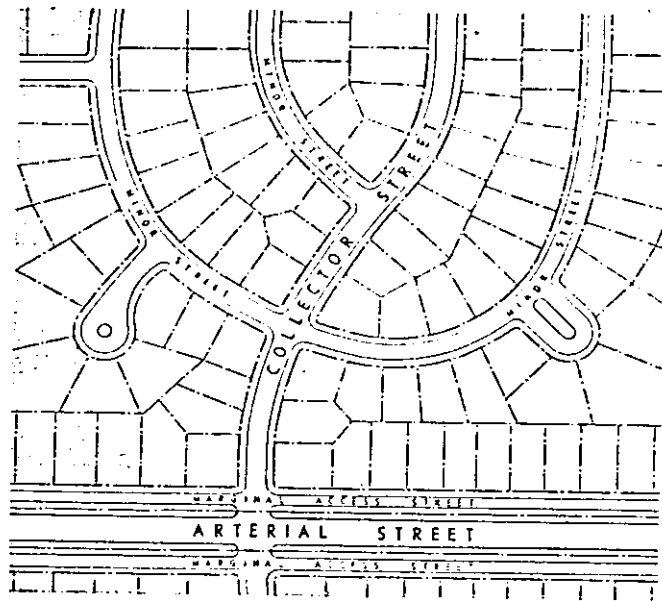
iv) Streets, streets (28) play an important role in the design of a subdivision for their important functional and spatial purposes. They provide for both vehicular and pedestrian access to property, and distribution of utility lines, such as water, sewage, gas, electricity and telephone systems. Also they affect the way the lots will be laid out and hence the spatial quality of the environment. A major street plan, in general, determines the arterial and collectors streets, while the location of minor or local access streets are left to the individual developer of each subdivision.

The street system of the proposed subdivision plan must be designed according to the major street plan while reserving a right-of-way for the location of major roads. The major street plan should also be kept in mind while determining main entrances to subdivisions, mainly from high-capacity streets. However, in large subdivisions, there should be a system of streets for different purposes within the subdivision. Certain streets should carry through traffic, while a minor system of streets (cul-de-sacs, loops) should provide access to different lots (Table 3.2) (Fig.3.4).

The new street pattern of the new subdivision should be coordinated with the existing street patterns of nearby subdivisions, both in alignment and width.



Source: NAHB, COST EFFECTIVE SITE PLANNING.



Source: Chiara and Koppelman, Urban planning and Design criteria.

FIG. 3.4. HIERARCHY OF RESIDENTIAL STREETS



TABLE 3.2 HIEARCHY OF STREETS.

Street Type	legal speed limit	R.o.w width (m)		F U N C T I O N	Traffic Volume	Parking		Residential frontage	R E M A R K S
		Int.(1)	National			On-Street	Off-Street		
1- Major arterials (major roads)	56-64	37-46	>30	Usally form boundaries of neighbourhoods	heavy	prohibited		not recommended	Not ideal for residential living conditions.
2- Minor arterials (Secondary roads)	56-64	25	20-30	Main feeder streets	heavy	prohibited		not recommended	Not ideal for residential living conditions.
3- Collector	48	12-15	14-18	Major residential streets. It conduct traffic between major arterial streets	Moderate	Emergency only		only for multi-family and as for courts	Not ideal for single-family housing front.
4- Sub-collector	40	9-12	8-12	It provides access to places and lanes	moderate	limited to single-family housing frontage	maximum use	as minimum	Not ideal for single-family housing front.
5- Distributors a- cul-de-sac b- loop-streets c- short-streets d- court		7-9	10-12	A dead end street to conduct mor chanelize traffic to and from dwelling units.	low	one side only	recommended max. use	recommended for single-family dwellings	Safer residential living conditions

Sources: 1. ULI, cost-effective site. Planning.  
 2. Gallion and Eisner, The Urban Pattern.

Furthermore, the street design is affected by the terrain of the new area needing subdivision. The alignments of streets affect the number of lots produced, construction cost, infrastructure, utilities cost and safety conditions. These factors all together indicate that the street system must be fitted to the topography of the area as well as to the development they serve.

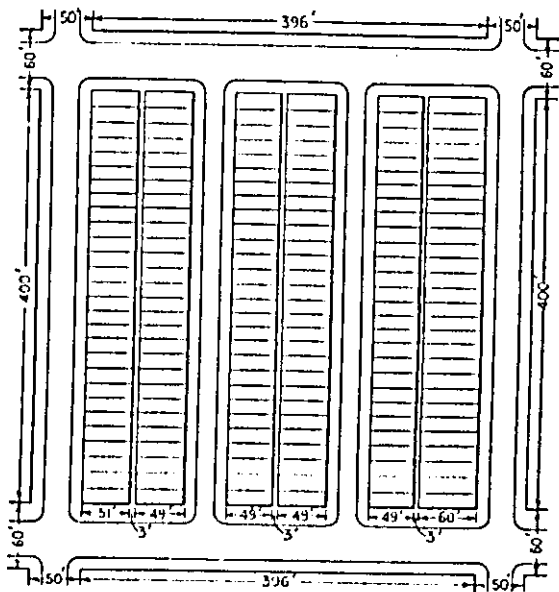
3.2.2. Current trends in land-subdivision design requirements.

The most appropriate sizes for individual building lots and the way they are combined into blocks, were the major features of land-subdivision requirements which were initiated after World War II (see section 3.2.1). The most important land-subdivision characteristics affecting the spatial and visual environment and which prevailed in the nineteen fifties and sixties (29), were as follows:

1. The rigid standardization of lot size, of a minimum width of 60 ft. (18.3m) and 100 ft. (30.5m) depth, was common to all types of land development. It was common to residential, commercial and industrial uses. This, in its turn, created a great monotony and was harmful to the visual and spatial environment.

who was responsible for dividing each block into lots of sizes that can be readily salable or for other purposes. The city authorities, realized the developer's desire and tried to establish block dimensions which will make it possible. For example, in Philadelphia, U.S.A. (Fig. 3.5), the typical early subdivision was blocks of 396 ft. by 400 ft. (120.8mX122m), surrounded by streets of 15.30m and 18.30m width (30). These blocks were frequently subdivided into smaller ones to provide for the single-family houses with two additional 12.2m wide streets. This, in turn, created 168 building plots that varied from 4.3m to 4.9m in width and from 14.95 to 18.30m in depth. Accordingly, the city ordinances prescribed a minimum width of 4.30m for any dwelling house and minimum open space of 13.4m<sup>2</sup> to meet preferences. This type of land-subdivision was also applicable in other cities of North America, for it created a variety of lot widths. It allowed owners to buy several of these units, each according to his needs. However, it was an intensive use of the land, with narrow residential streets for which Philadelphia is known today.

Different land-subdivision design requirements had emerged, to increase the exploitation of land, to



A block 396 feet by 400 feet in size was subdivided to provide 168 building lots, or 46 dwellings to the acre.

FIG. 3.5. TYPICAL EARLY SUBDIVISIONS IN THE CITY OF PHILADELPHIA.

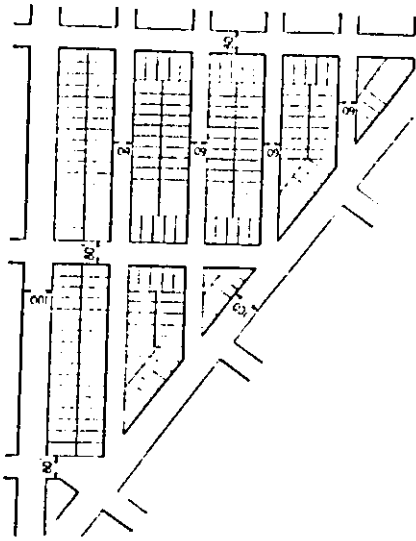
Source: LEWIS, PLANNING THE MODERN CITY. VOL. 1

eliminate the monotony and to improve the prevailing methods. i.e standard lot size and the continuation of the rectangular system of streets. These can be summarized as follows, (31) (Fig. 3.6):

1. Narrowing the width of local streets with eliminating acute intersections.
2. Using suitable sizes of building lots to accomodate the various type of residential houses.
3. Provision of small neighbourhood park.
4. Provision of a variety of housing types i.e. single-family, two-families and group housing.

Current land-subdivision design requirements take all of the above elements into consideration (see Table 3.3 to Table 3.6), besides concentrating on the following elements:

1. Density, which is the number of dwelling units per area, is the primary development standard that affects the life style, the economics and the visual and spatial environment of residential developments (see Appendix III).
2. Hierarchy of streets is of importance in providing livable spaces, besides affecting housing frontages. This, in turn, affects development cost and land utilization (Tables 3.2, 3.3 & 3.4).



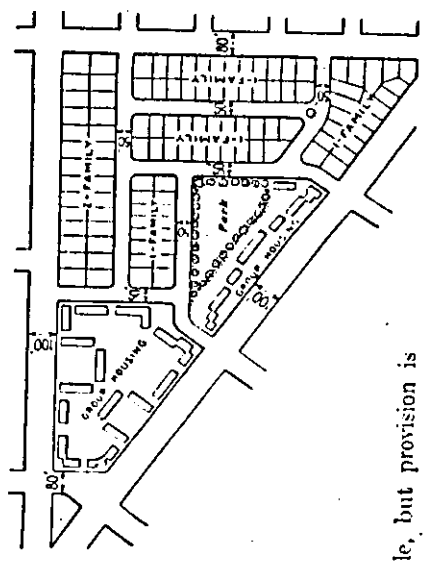
1. PLAN SHOWING A CONVENTIONAL METHOD OF SUBDIVIDING A TRIANGULAR AREA

Blocks are 200 by 700 feet and streets 60 and 80 feet wide, resulting in acute intersections with the diagonal bounding street, and providing building plots 40 feet wide and 100 feet deep.

COMPARATIVE STATISTICS OF THE SAME AREA UNDER THREE DIFFERENT METHODS OF SUBDIVISION,

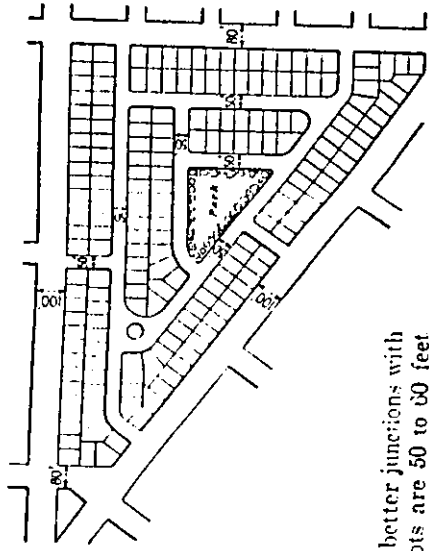
Item	1	2	3
Street area, as percentage of total	24.0	23.6	16.4
Public park area, as percentage of total	0.0	5.7	7.7
Building block area, as percentage of total			
Linear feet of streets	76.0	70.7	75.9
Total number of lots	4,800	5,120	3,570
Average area of lots, square feet	302	196	216*
	4,380	3,920	3,810 <sup>b</sup>

\* Families.  
<sup>b</sup> Per family.



2. ALTERNATIVE SUBDIVISION

Streets are again 50 feet wide, but provision is made for variety in types of housing.



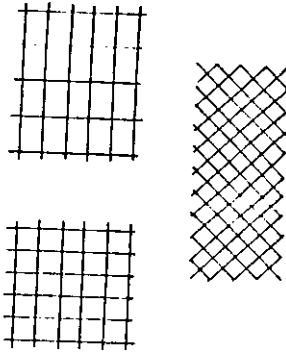
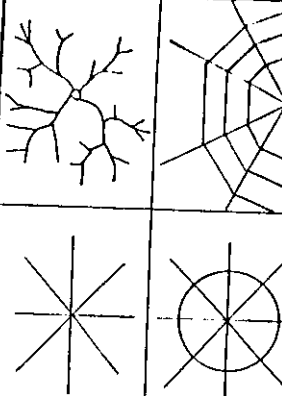
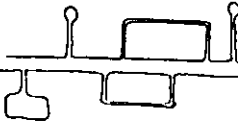
3. ALTERNATIVE SUBDIVISION

Streets are 50 feet wide, with better junctions with the diagonal bounding street, lots are 50 to 60 feet wide and 80 feet deep, and a small neighborhood park is provided.

FIG. 3.5. RESIDENTIAL SUBDIVISIONS IN THE 1950s AND 1960s.  
 Source: LEWIS, PLANNING THE MODERN CITY. VOL.1

3. Type of housing and house groupings determine the method of land exploitation and subdivision, the location of open spaces and parking requirements, (Tables 3.5, 3.6).
4. The prevailing building regulations and its importance in affecting land-subdivision methods, and hence the urban character of the built-environment. It is thus realized that new land-subdivision patterns have environmental, social and financial impacts on the urban built-environment. This have broadened the conceren beyond that of just assigning lots, blocks and streets to consider the proper visual and spatial environment in new developments (see Appendix IV).
5. Open spaces are very important elements in the urban environment and have direct effects on the spatial form and úrban character as well as on the proportions of building lots and their qualities. It is worth emphasizing their important functions, which are as follow:-
- i) Providing buildings with sufficient lighting and ventilation;
  - ii) Providing a space for outdoor activities and promoting living standards;
  - iii) Enhancing the visual and perceptual effects and building forms through the interaction between the building itself and its surroundings;

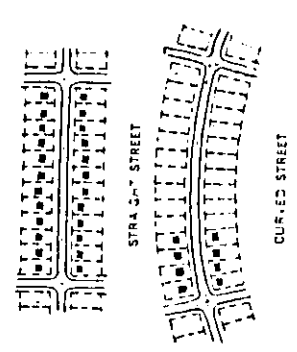
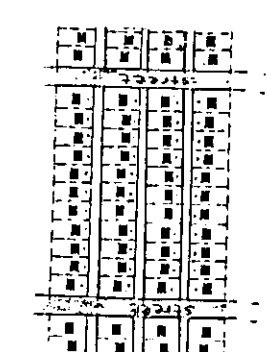
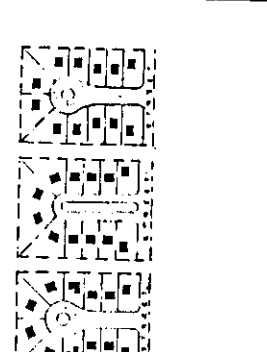
TABLE 3.3 STREET NETWORK PATTERNS

TYPE	DESCRIPTION	SHAPE	ADVANTAGES	DISADVANTAGES
1- Grid System	A series of streets, approximately at right angles to each others.		<ul style="list-style-type: none"> <li>The blocks produced are easily subdivided.</li> <li>Design of utilities is generally simpler in straight roads.</li> </ul>	<ul style="list-style-type: none"> <li>The system is not convenient for irregular topography.</li> <li>It creates visual monotony.</li> <li>No difference between low traffic and high traffic streets.</li> </ul>
2- Radial System	A series of major streets, radiating from the central area and supplemented by a series of circumferential streets.		<ul style="list-style-type: none"> <li>The system is applicable to any topography.</li> <li>Less cost in terms of street construction and maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>Irregularly shaped parcels of land is left, which are difficult to be subdivided.</li> <li>Design of utility services is more complicated.</li> </ul>
3- Linear System	A single line or a series of parallel lines into which all activities are linked.		<ul style="list-style-type: none"> <li>Road is used to its maximum, which makes the system convenient when road cost is high.</li> </ul>	<ul style="list-style-type: none"> <li>The system is overloaded because of the movements.</li> <li>It lacks focal points.</li> </ul>

Source: - Kevin Lynch and Hack Cary, site planning (Cambridge: MIT press, 1984), P. 195-197  
 - Joseph de Chiara and Lee Koppleman, Urban planning and Design criteria (New York: VNR company, 1982), P. 224-225.

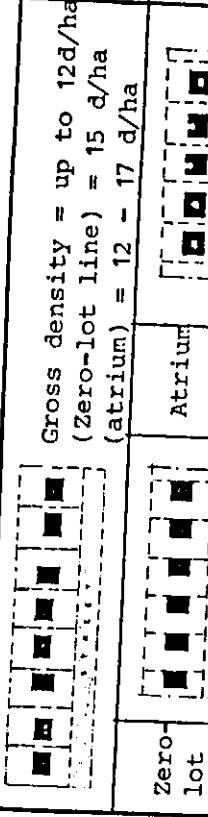
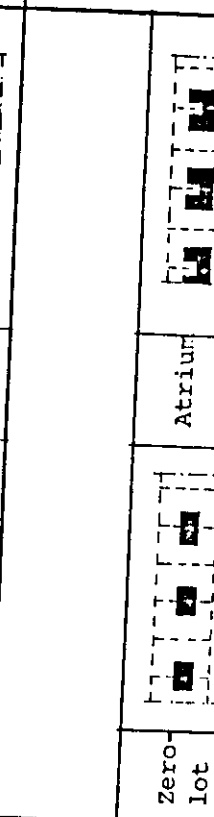
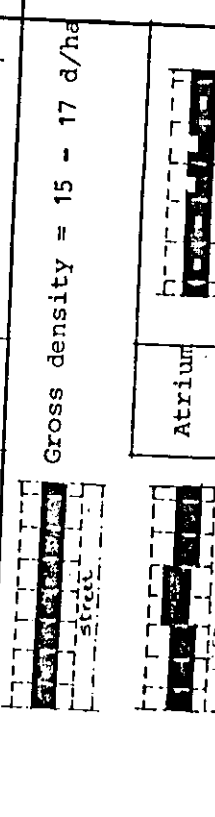

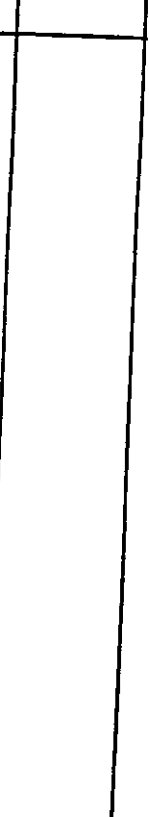


TABLE 3.4 PATTERNS OF RESIDENTIAL MODULES (LINEAR).

TYPE	DESCRIPTION	PATTERN ARRANGEMENT	ADVANTAGES	DISADVANTAGES
1- The street front pattern a- The grid street plan b- curved streets	Where row of houses line both sides of the street. It is the most common type.		<ul style="list-style-type: none"> <li>Access is easy and obvious in the grid-street plan.</li> <li>Curved streets are pleasant and gives natural effect in topographical conditions.</li> </ul>	<ul style="list-style-type: none"> <li>The grid-street plan is visually monotonous. (monotony can be reduced by variation in path-alignment, set-backs and landscape).</li> <li>Excessive use of curved streets on flat land is dangerous and uneconomical.</li> </ul>
2- End on street pattern.	Where row of houses are placed at right-angle to the street, with either common or separate entrance pathways.		<ul style="list-style-type: none"> <li>Site development cost is reduced (street frontage per unit is reduced).</li> </ul>	<ul style="list-style-type: none"> <li>Difficult and un-obvious accesses.</li> </ul>
3- Dead-end (Cul-de-sac) pattern	Where a group of houses are arranged along the cul-de-sac.		<ul style="list-style-type: none"> <li>Provides privacy and traffic separation.</li> <li>Significant changes in infrastructure cost.</li> </ul>	<ul style="list-style-type: none"> <li>May be inappropriate for a special family households.</li> </ul>

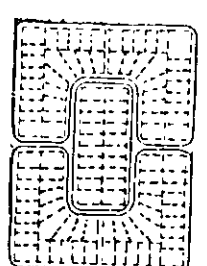
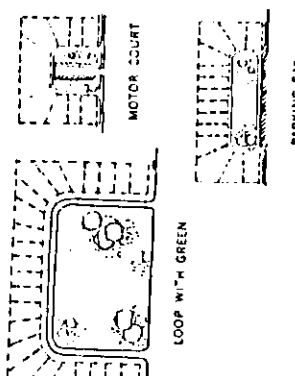
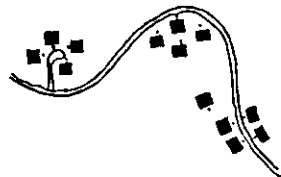
Sources: 1. Lynch and Gary, Site planning.  
 2. Chiara and Koppelman, Urban Planning and Design criteria.

TABLE 3.6 HOUSING TYPES.

T Y P E S	D E S C R I P T I O N	H O U S I N G G R O U P S		R E M A R K S
1- Detached (Single-family)	Where each house is an isolated structure on its own land.	 <p>Gross density = up to 12d/ha (Zero-lot line) = 15 d/ha (atrium) = 12 - 17 d/ha</p>		- Low-density grouping -  Note: 1 hectare (ha) = 10 dunums
2- Semi-detached (Single-family)	Where houses are joined from one side only.			- Reduce development cost.
3- Attached (Single-family)	Where houses are joined side by side.	 <p>Gross density = 15 - 17 d/ha</p>		- Row house provides the most space at the lowest cost.
4- Apartments (Multi-family)	Multi-storey building consisting of a number of apartments.			- High-density grouping
5- Hybrid	Two or more forms of housing are mixed.			- Good in meeting different preferences and enhancing the visual environment.

Source: Lynch & Gary, Site Planning  
 UII, Residential development handbook.  
 NAB, Cost-effective site. Planning.

TABLE 3.5 PATTERNS OF RESIDENTIAL MODULES (LOOP).

TYPE	DESCRIPTION	PATTERN ARRANGEMENT	ADVANTAGES	DISADVANTAGES
1- Loop within grid.	A loop street within a grid of housing groups.	 <p>LOOP WITHIN A GRID ARRANGEMENT</p>	<ul style="list-style-type: none"> <li>provides the privacy, safety and economy without the difficulties of turning.</li> </ul>	<ul style="list-style-type: none"> <li>Dense and rigid grouping of housing with no public open spaces.</li> </ul>
2- Court arrangement	Where a group of houses are arranged around a common open space. The vehicular circulation are either permissible or excluded.	 <p>LOOP WITH GREEN</p> <p>MOTOR COURT</p> <p>PARKING BAY</p>	<ul style="list-style-type: none"> <li>Promote neighbourly relations (Social &amp; visual).</li> <li>Economical (except when loop are brought to court).</li> </ul>	<ul style="list-style-type: none"> <li>May complicate the street system.</li> <li>houses are difficult to be located for a strangers.</li> <li>inappropriate for hilly areas (destroy the visual unity).</li> </ul>
3- Cluster	Where a group of houses are concentrated and surrounded by open spaces. The street may pass alongside the cluster or penetrate it.		<ul style="list-style-type: none"> <li>A strong visual effect of mass is produced.</li> <li>Significant savings on roads and utilities.</li> <li>Preserve open spaces.</li> </ul>	<ul style="list-style-type: none"> <li>Interrelations between individual buildings in terms of privacy and the use of land.</li> </ul>

Sources: 1. Lynch and Gary, Site planning.  
 2. Chiara and Koppelman, Urban planning and Design criteria.

Thus following requirements should be kept in mind when first subdividing the land into lots so that to achieve the above objectives: Narrow open spaces between high-rise buildings should be avoided; very large public open spaces are not recommended. While, smaller ones can be easily controlled and maintained while enhancing the feeling of belonging, and that providing a front set-backs for the buildings may improve the spatial and integrative qualities of built form and open space.

### 3.3. Existing urban development and land-subdivision in Amman's residential areas.

The existing urban developments within Greater Amman forms about 17 percent of its total municipal area, with 69 percent undeveloped or partially cultivated, and the remaining 14 percent for agricultural purposes (32). The residential developments within Greater Amman area, occupies 54 percent of urban land, that is, people's dwellings occupy more than half of the urban area, emphasizing the important role of residential development in shaping the built-environment.

It is estimated that 80% of all dwellings in Greater Amman built between 1980 and 1985 (33) were

built privately by small scale developers and owner-builders. The rest was built by public agencies, housing co-operatives and real-estate developers. By 1985, the estimated number of occupied dwellings in Greater Amman was about 141,000 dwellings. The housing types within Greater Amman Municipality are mainly of two types; the low-rise apartment buildings (about 60% of total dwellings), and the one or two storey detached housing (about 30% of total dwellings, including minor percentage of attached housing). The remaining 10% are single storey dwellings within refugee camps and informal housing. Two thirds of all dwellings are owner-occupied, and about one-quarter is rented.

People's residences affect and in turn are affected by their occupiers' cultural and socio-economic backgrounds, their needs and desires, the space they live in, the surrounding streets and spaces, i.e. the whole environ in which they work, live and raise the nation's future generations. All of these aspects should be considered when shaping the urban built-environment through the application of building and land-subdivision regulations and land-development controls.

3.3.1. Land-subdivision and development ordinances and controls.

Zoning ordinances applied in Greater Amman Municipality, include standards for minimum plot area and minimum frontage for each sub-zone. These standards are contained in the Planning and Building Regulations of 1979 (see section 2.2.3). Prior to the regulations of 1979, a separate planning code and building by-laws of 1965 was in effect (see Table 3.7).

The municipal area was divided into three major zones; residential, commercial and industrial. The residential zone was subdivided into sub-zones: A, B, C and D. Failures to apply these regulations were noticed particularly as average lot built areas were below the legal minimum as well as the absence of provision within the regulations for lowest-income groups. Furthermore, the development projects of the time were not in accordance with the standards set by the regulations especially those controlling building plot-ratios, which were usually greatly exceeded (34).

This whole situation, necessitated the emergence of a new law, the planning and Building Regulations of 1979. Requirements of the old regulations before 1979 were modified, increasing the minimum plot area, the

Zone	Minimum Plot Area (m <sup>2</sup> )	Maximum Building Ratio %	Minimum Frontage (m)	Setbacks			Maximum Height (m)	Floors
				Front	Side	Rear		
<b>Residential</b>								
A	1,000	30	25	5	5	7	12	3
B	750	33	20	4	4	6	12	3
C	500	40	15	4	3	4	12	3
D	300	40	13	3	2.5	2.5	12	3
<b>Commercial</b>								
Central Commercial	200	-	12	-	-	4	12 <sup>2/3</sup>	
Linear Commercial	300	60	12	-	4 <sup>1/2</sup>	4	12 <sup>2/3</sup>	
Local Commercial	400 (A+B) 200 (C+D)	50	15	Same as zone located in			12	3
<b>Industrial</b>								
Heavy Industry	1,000	75	25	4 <sup>2/3</sup>	4	5	16	
Light Industry	400	50	18	3	2.5	2.5	12	
<ol style="list-style-type: none"> <li>Four meter setbacks are required only of plots having depths greater than 15 meters.</li> <li>Height restrictions are either 3/4 of the width of the street plus the front setback or 12 meters.</li> <li>Front setbacks are four meters or 1/4 of the width of the street, which ever is greater.</li> </ol>								

TABLE 3.7

THE PREVAILED PLANNING AND BUILDING REGULATIONS PRIOR TO 1979.

SOURCE:

AURP6, PLANNED DEVELOPMENT IN BALQA-AMMAN REGION.

maximum plot ratio and the minimum frontage, thus producing larger lots. Additional provisions were also introduced such as, the residential "popular" sub-zone and the residential "green" sub-zone to serve wider ranges of income groups (35). The land development controls which are currently applied within the Greater Amman Municipality are based on this law, no. 67 of 1979. These regulations are responsible for controlling the use of land, the building bulk and height, land-plot coverage, setbacks and parking requirements, minimum frontage and minimum plot area (see section 2.2.3).

### 3.3.2. Current problems associated with land-subdivision and development regulations.

The existing land-subdivision Requirements as stated by the Planning and Building Regulations of 1979, are as follows:

- 1- Land-subdivision and road width should be in accordance with the Detailed Development Plan (36)
- 2- Minimum plot area and minimum frontage are stated according to zone areas, (37) (see section 2.2.3).
- 3- Open spaces should constitute 10% of the total plot area as a minimum for private gardens (38).
- 4- Minimum width of a local road is 14m in general, Nevertheless, it is 8m if the road is connecting a



maximum of six lots and 4m if the road is serving one lot only (39).

5- Each subdivision must be located on a road either existing or suggested and needing approval (40).

However, there are a number of problems associated with the current Planning and Building Regulation no. 67 of 1979, regarding land-subdivision and development requirements. These may be summarized as follows:

- 1- The rigid application of the regulations affects the flexibility requirements in the urban design approach to residential developments.
- 2- Since the building plot-ratios have been increased, the areas of private open space per lot has decreased. These open spaces which form the front, rear and side yards in the prevailing detached type house became strips of land, or mostly acting as passages around the building rather than a green area of spatial quality.
- 3- Increasing the minimum lot frontage required increased infrastructure development costs (road network, water supply, electricity, telephones, sewage and surface drainage services). Lots with narrower frontages also generate more private open space at the rear and front.

- 4- The minimum lot size area of 150m<sup>2</sup> for the popular sub-zone in 20% of the developed land in Greater Amman was established as a recognition of the need for smaller size lots for low and middle income families. However, this cannot be afforded except by families whose annual income is 4500 J.D. at least (41), while the annual family income for 60% in Amman is less than 3600 J.D, (42).
- 5- The rigid application of regulations and sub-Zone categorizations resulted in a lack of diversification in dwelling types that can satisfy the various family compositions, characteristics and preferences. Changes in design approach and type of house can create variety, flexibility and enhance the visual character of the spatial environment.
- 6- There is a lack of road hierarchy in residential areas, which is important in relationship to the subdivision's minimum lot area and frontage, intensity of development and land-use and density requirements.
- 7- The current regulations lack the controls over residential densities, which may allow variations within it for each residential sub-zone. The number of dwelling units per area is much more important than specifying the minimum lot area per dwelling. A variety of dwelling types and patterns can be

interwoven within the overall physical and spatial form of the environment. This, while meeting the maximum density requirements may help create flexibility in the provision of open spaces besides the improved and appropriate usage of land.

8- The land-subdivision and development regulations currently in use do not specify or give guidelines for large-urban design residential development projects.

#### 3.4. The need for modified (urban design) regulations.

As previously discussed, the Planning and Building Regulations of 1979 have a variety of associated problems. These may have resulted due to the fact that the regulations only dealt with land-subdivision standards with its minimum frontages and minimum lot areas. This approach correlate with these approaches of the nineteen fifties and sixties dealing with the appropriate block and lot size (width and breadth) (see section 3.2.1), without any consideration to dwelling type, road hierarchy, open spaces or the spatial urban form.

It is worth mentioning, however, that in 1981 a study was prepared by the Ministry of Municipal and Rural Affairs and Environment, which was neither followed-up to completion nor to implementation (see Appendix V). This study's main objective was to develop a new set of planning and building regulations, based on law no. 79

of 1966 for Village and Country Planning. The study comprised the following aspects:

- 1- The diversification of dwelling types and the addition of new types, i.e. row houses and high-rise.
- 2- The investigation of a new minimum lot area, minimum frontage and reduced setbacks; The cancellation of the residential Green sub-zone and the introduction of the residential E sub-zone with a minimum lot area of 150m<sup>2</sup> , besides the common residential types A,B,C, and D.
- 3- A road hierarchy was identified with the corresponding minimum lot area, minimum frontage and depth, each according to the type of road (see Appendix v).
- 4- Land-subdivision and development regulations were specified for various types of large-size development projects, e.g. residential, commercial, industrial and multi-purpose projects.

As mentioned before, this study was abandoned after initiating two drafts in 1981. At the time, the study lacked the most important aspect of controlling residential densities, yet it still offered the right approach for the provision of developing urban land areas. It may thus, be regarded as a starting point for evolving and modifying the current legislations, so that they regulate and control the following:

- 1- The efficient use of the lot area, to accommodate

the dwelling, private garden, parking requirements and pathways.

2- Applying the net density method to control and regulate land-subdivision. By specifying number of dwellings required per development site according to household size, preferences and income level, so that the remainder of land may be available as a common area.

3- The use of a road-hierarchy, to ensure maximizing the use of narrower house frontages:

- a) To minimize infrastructure and development cost;
- b) To maximize land utilization, since the type of street the house faces affects the amount of setbacks;
- c) To provide safer living conditions through controlling traffic speeds;
- d) To encourage a stronger sense of belonging and neighbourhood identity.

4- Diversification in dwelling types to meet the various house-hold structure, characteristics, preferences and their income level. This, in turn, allows for

### Summary of Chapter.

Through history, land-subdivision methods were partly responsible of shaping our cities patterns, for building development is partly affected by the way the land is sub-divided. Before World War I, different residential developments attempted to improve bad conditions resulting from the use of small lots of land with 85 percent lot coverage, which prevailed till the late 19<sup>th</sup> century. After World War I, many developments of wide frontage lots with shallow depth (approximately two rooms) were used to allow for a better arrangement of buildings. The land-subdivision standards were doubled and the lot coverage was reduced to 50%, to allow for the use of the rest of land for recreational purposes to enhance the environment and improve living conditions.

After World War II, the appropriate sizes of building lots and the ways they may be combined into blocks, were the major features of land-subdivision requirements. This, in turn, resulted in the appearance of land-subdivision standards, which dealt with block size and arrangement, lot size, shape and location and streets. Most of these standard are still in use till today.

Land-subdivision design requirements should be concerned with the reducing of development costs through the use of smaller lot sizes; the creation of more livable residential environments by combining all elements and spaces surrounding the individual building lot; and the promotion of the visual and spatial quality of the environment, its maintenance and enhancement. Furthermore, the use of a variety of lot sizes according to density control policy would meet and satisfy the different preferences and habits of the inhabitants and would correspond to their socio-economic needs.

References of chapter

- 1- Arnold, The practice of local government planning, P.289.
- 2- Kevin Lynch and Gary Hack, Site Planning (Massachusetts: MIT Press, 1984), P. 1.
- 3- Gallion and Eisner, The Urban Pattern, P.117-119.
- 4- Ibid., P.119-121
- 5- Ibid., P.121-123
- 6- Ibid., P.123
- 7- Ibid., P.123-125
- 8- Ibid., P.128
- 9- Ibid., P.132
- 10- Arhur Gallion and Simon Eisner, The Urban Pattern. City Planning and Design; 6 th edition, (New York: DVN Company, 1986), P.85.
- 11- Ibid., P.472.
- 12- Lewis, Planning the Modern City, Vol.1, P.152-153.
- 13- ULI, The Community Builders Handbook (Washington D.C.: ULI, 1950), P.49.
- 14- Ibid., P.50.
- 15- Ibid.



- 16- William Goodman, Principles and Practice of Urban Planning (Washington: ICMO, 1986), P.460.
- 17- ULI, The Community Builders Handbook, P.51.
- 18- Ibid., P.53.
- 19- Ibid.
- 20- Goodman, Principles and practice of Urban Planning, P.460.
- 21- ULI, The Community Builders Handbook, P.55.
- 22- Lewis, Planning the Modern City, P.135.
- 23- ULI, The Community Builders Handbook, P.53-54.
- 24- Goodman, Principles and practice of Urban Planning, P.460.
- 25- ULI, The Community Builders Handbook, P.55
- 26- O'Mara, Residential Development Handbook, P.183.
- 27- Ibid., P.183-184
- 28- Goodman, Principles and practice of Urban Planning, P.455-457.
- 29- Lewis, Planning the Modern City, Vol.1, P.153.
- 30- Ibid., P.153-154
- 31- Ibid., P.154-155

- 32- Comprehensive Development Plan for Greater Amman, P.6.4.
- 33- Ibid., P.6.9
- 34- AUPRG, Planned Development in Amman-Balqa Region, P.III-3-25.
- 35- Ibid., P.III-3-26
- 36- Planning and Building regulations, 1979. Article 45-A.
- 37- Ibid., Article 45-B.
- 38- Ibid., Article 21
- 39- Ibid., Article 46
- 40- Article 28-5 of law no. 79 of 1966.
- 41- Based on data from National housing strategy, 1987.
- 42- Based on information from Greater Amman Comprehensive Development Plan, 1987, Fig. 5.9.

## Chapter 4:

### Case Study:

#### A Residential Area in Umm-Al-Summaq, Amman.

The study area is the Engineers Housing located within Umm-AL-Summaq area, surrounded by Mecca street from the north, Aqsa Street from the south, Medical Centre street from the west and Abdullah-Gosheh street from the east, (Fig. 4.1).

#### 4.1. Choosing the study area.

1- The study area is one of the earliest residential developments at Umm-Al-Summaq area in 1970. This may have encouraged the urban sprawl of the late 70's and early 80's towards the outskirts of Amman, which possibly influenced the subdivision pattern of the area.

2- The study area, is an example of large-residential and subdivisions belonging to one developer, i.e. The Engineers Housing Co-operative. The outcome, however, was similar to any individual private housing project, reflecting the failure of the current legislation to regulate for large residential subdivision projects and the rigidity of its application.

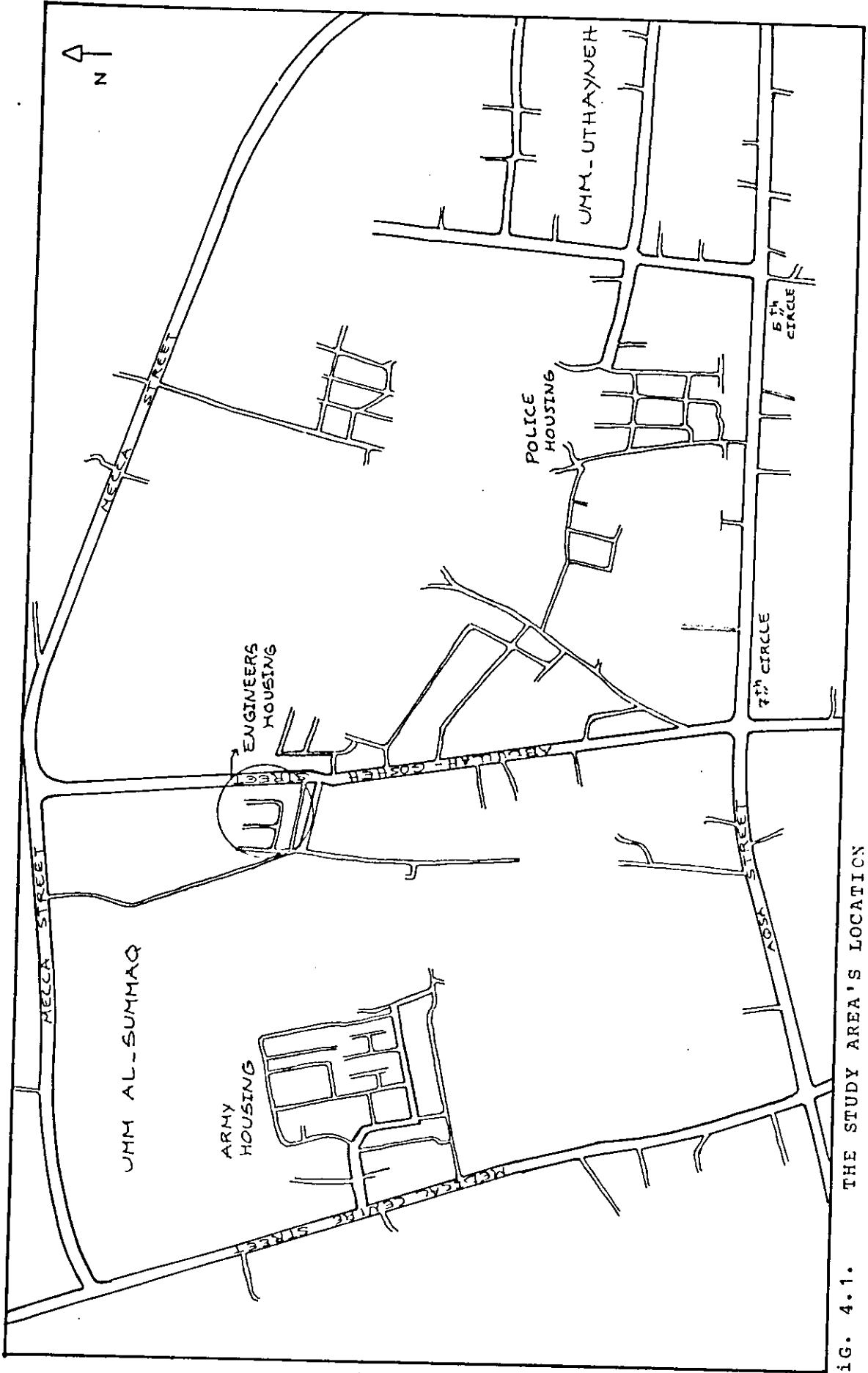


FIG. 4.1. THE STUDY AREA'S LOCATION (ENGINEERS HOUSING AT UMM AL-SUMMAQ)

- 3- The owner-occupiers of the dwellings in the study area are of similar socio-economic status. That is, they may be considered of similar preferences, behaviour, and functional and spatial requirements.
- 4- The prevailing land-use in the study area is the residential C sub-zone, which forms about 22% of the total developed residential areas within Greater Amman Municipality (see section 3.3). However, the latest studies show that although C and D sub-zones form about 54% of total developed residential areas, they are still inadequate to meet current and predicted future demand (1).
- 5- The study area is surrounded by a minor-arterial road and two collector roads. This provides the opportunity of land-subdivision utilizing the street-hierarchy consideration (see section 3.2.2).
- 6- The study area still contains a peripheral and undeveloped land of about 1.7 dunums that was intended for use as public open space since 1970. This indicates the importance of earmarking appropriate land areas for required needs so that land lots are used efficiently and as intended.

7- The shape of the study area is a deformed rectangle, which may provide an opportunity for the application of different land-subdivision standards with regard to lotting.

8- The study area is close to commercial facilities.

9- The study area is located within a very low-density area, which is typical of most of the newly developed land outside the city centre.

#### 4.2. Site analysis of study area.

The study site gross area is about 29.7 dunums, surrounded and approached by the minor-arterial Abdullah-Gosheh street from the east and two collector roads from the south and west (Fig. 4.1). The topography of the study area has a slight slope of about 4% and is planned and subdivided in accordance with the regulations applicable to residential C sub-zone (see section 2.2.3).

The land area comprises 31 detached-type dwelling units, consisting mainly of three prototypes with very slight differences in layout. These are as follows (Fig. 4.2):

- a. Prototype A: comprising 15 dwelling units, each unit of 220 m<sup>2</sup> built-up area.

- b. Prototype B: comprising 13 dwelling units, each unit of 200 m<sup>2</sup> built-up area.
- c. Prototype C: comprising 3 dwelling units, each unit of 180 m<sup>2</sup> built-up area.

The units were built in 1970 of one floor height. However, recently, four dwelling units were developed to three floors and another two dwellings into two floors. Areas of land utilization within the study area are as follow:

- a. Public areas including all circulation areas: local streets and pathways used by vehicles and pedestrians constituting about 13.5% of total area (4 dunums) with a total length of 271.30m.
- b. Private areas: including all lot areas constituting about 80.8% of total land area (24 dunums).
- c. Semi-public area: about 5.7% of total land area (1.7 dunums) located in between the minor-arterial street and the local street (Fig. 4.2). It was intended for use as a community facility. Nevertheless, it remained undeveloped and deserted till today, except for a guard room which was used in the late 1977 as a telephone exchange.

This residential development serves a group of 200 inhabitants of similar socio-economic backgrounds.

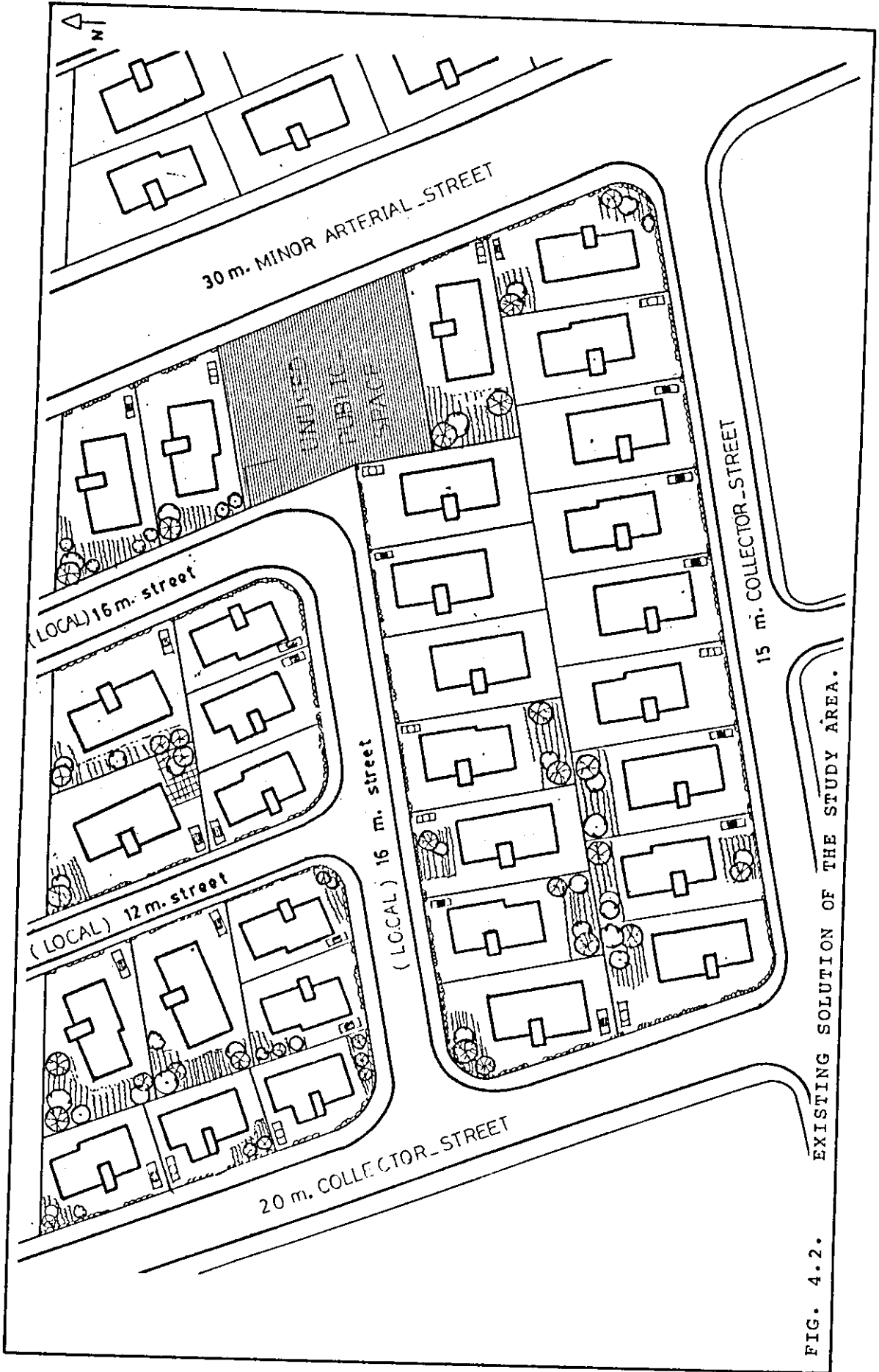


FIG. 4.2. EXISTING SOLUTION OF THE STUDY AREA.



Private ownership (owner-occupier) is the prevailing form of land tenure in this development and could be classified as a low-density area (67.34 P/ha), which according to the classification of Greater Amman Comprehensive Development Plan ranges between (41-125 P/ha), or (8-21 HH/ha), (2).

The existing lot areas range between 500 m<sup>2</sup> to 970 m<sup>2</sup>. However, 50% of the total lots (Fig. 4.3), have areas of 750 m<sup>2</sup> with approximate dimensions of 20 m by 37.5m. Each lot has two entrances, one for pedestrian use and the other is for private parking requirements (avg. 2 cars/HH), while guest parking is located on-street, (Fig. 4.2).

The average building ratio is about 30% (Table 4.1). The minimum side setbacks are commonly 3.0m, while the front and rear setbacks offer some variety specially in the larger lots, (Fig. 4.2).

The lots are serviced from either the minor-arterial street (13%), collector streets (52%) or the local streets (35%), (Fig. 4.2). The services and utilities available to the site comprise: water supply, sewage disposal, street lighting, electricity, refuse collection and public transportation (buses).

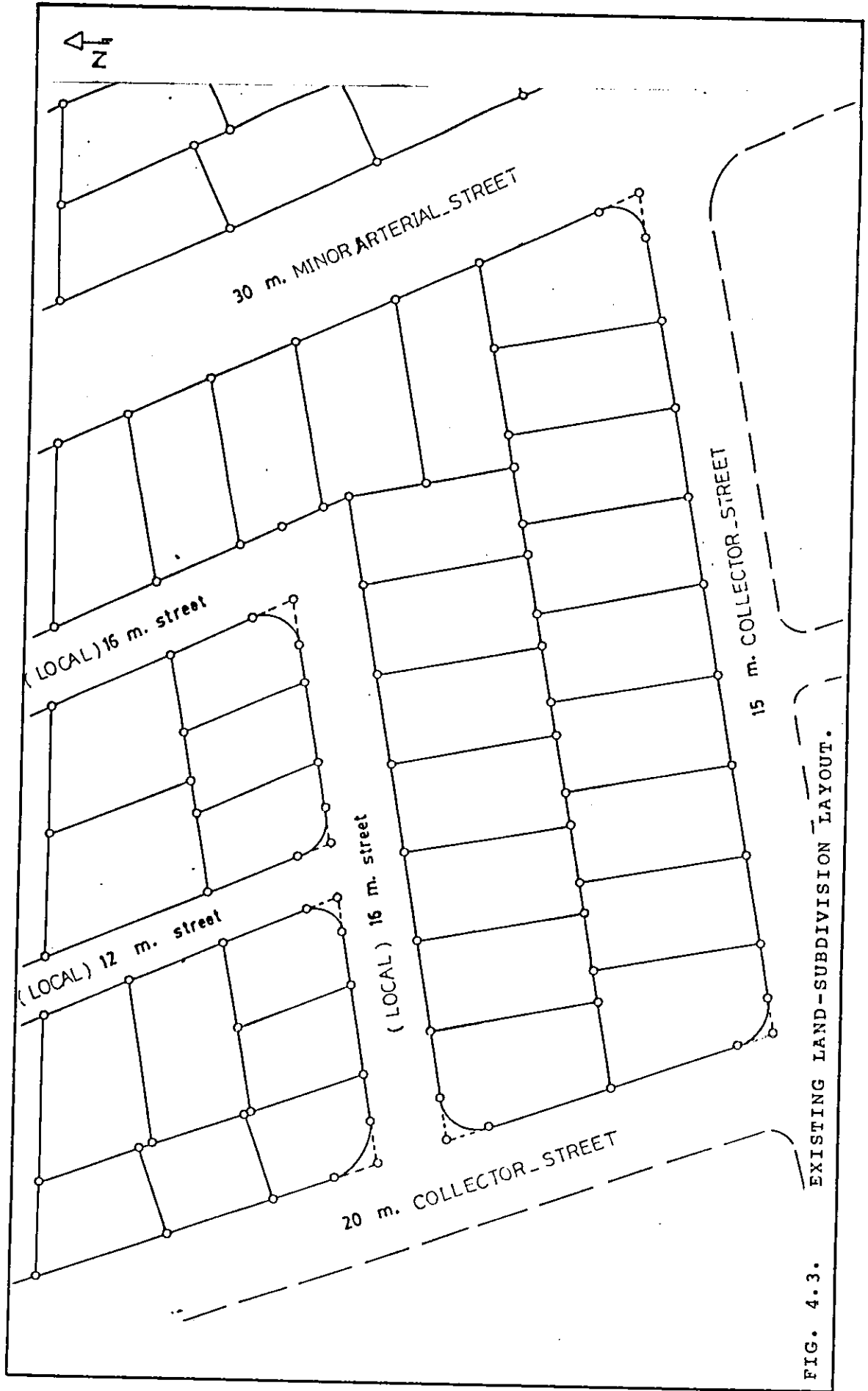


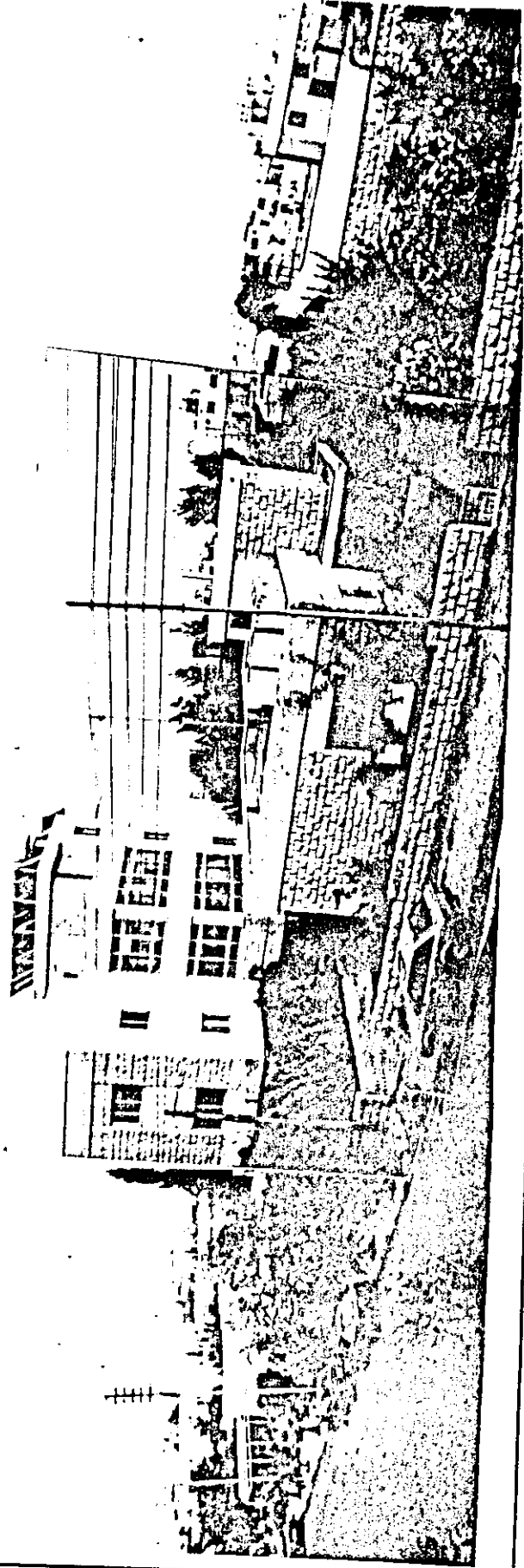
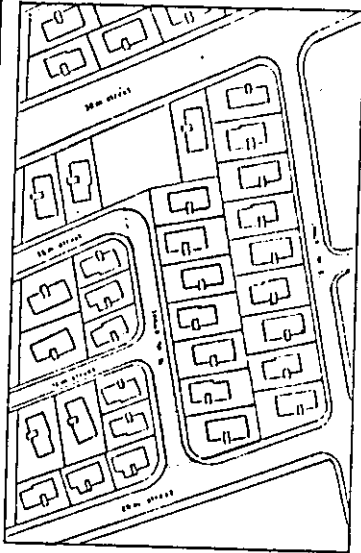
FIG. 4.3. EXISTING LAND-SUBDIVISION LAYOUT.

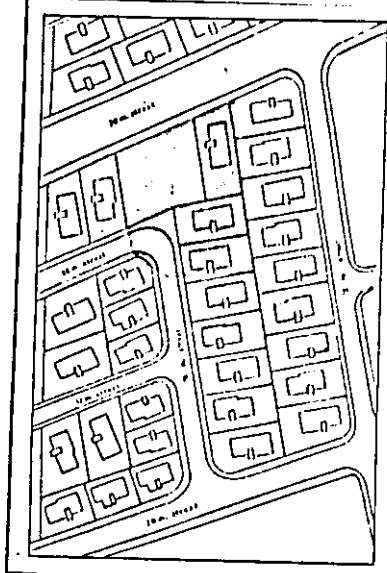
#### 4.3. The Current situation and associated problems.

The existing physical and spatial environmental conditions in the study area, resulting from applying current land-subdivision regulations, may be summarized as follows:

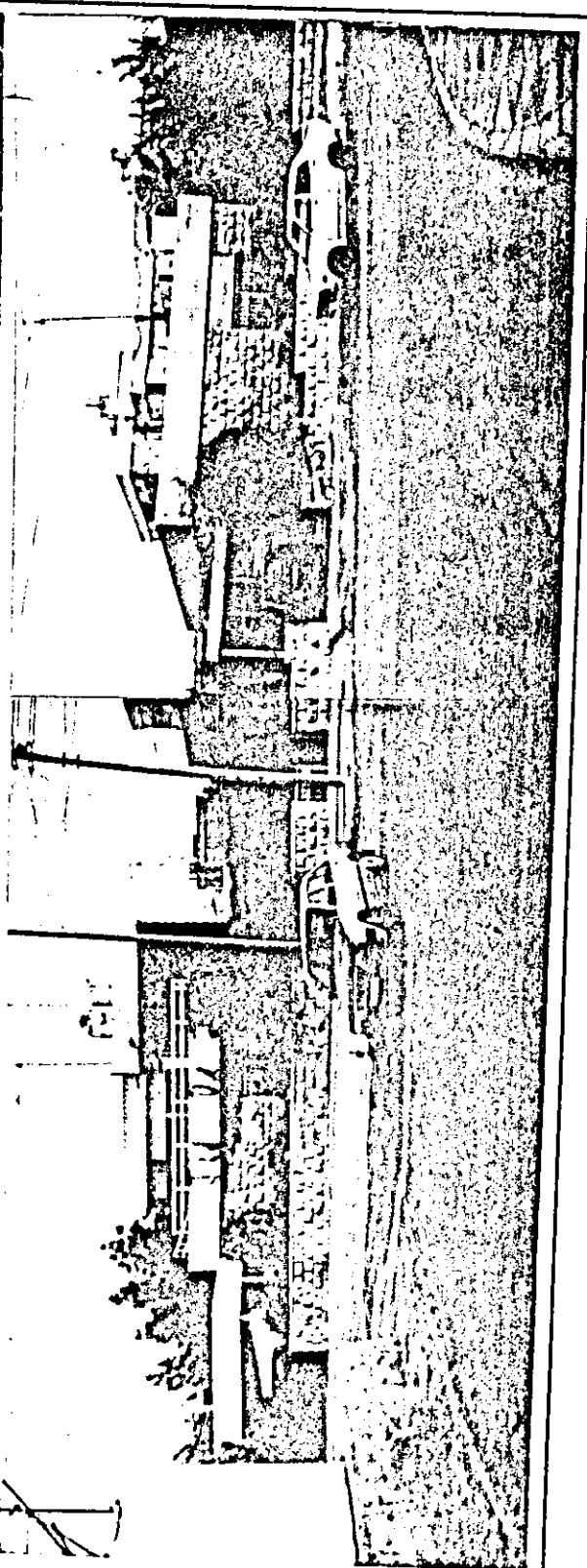
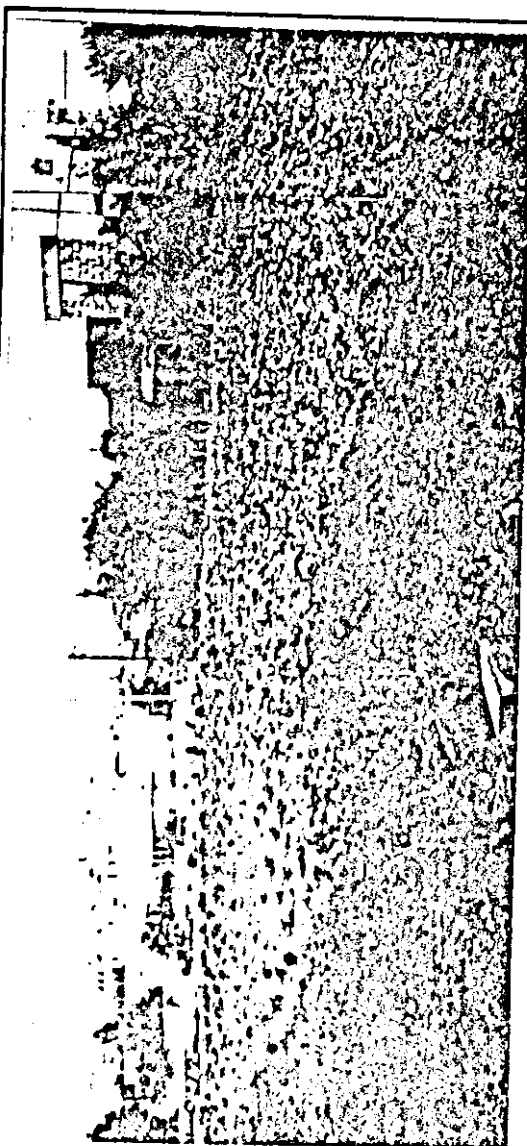
- 1- The existing dwelling units' prototypes i.e. A,B and C, are almost alike. Thus, the variety required to satisfy different preferences and to enhance the overall urban form is not met.
- 2- The siting of dwelling units within the lots are the same for all prototypes, and the distribution of prototypes are not in accordance with the plot areas.
- 3- There is an unbalanced lot distribution within the overall land area, where the smaller lots are used as corner lots and butt lots affecting the usable spaces. These lots are not in accordance with land-subdivision standards with regard to corner lot's width and the acute angles located at the rear lot lines, (see section 3.2.1). Also about 13% of lots are located on the minor-arterial road, without any variation in design requirements. This affects the safety aspects and increases health hazards, e.g. noise and fumes, (see section 3.2.1).

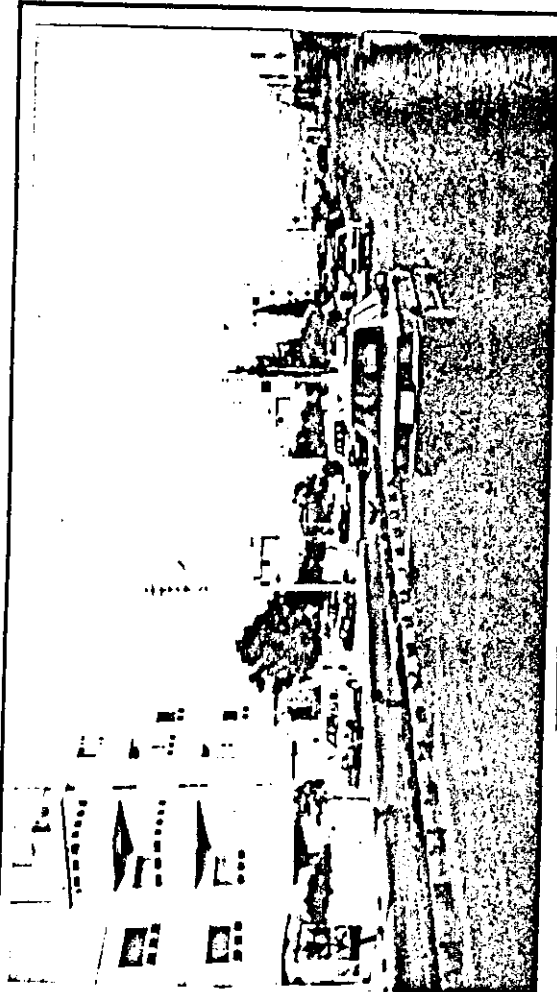
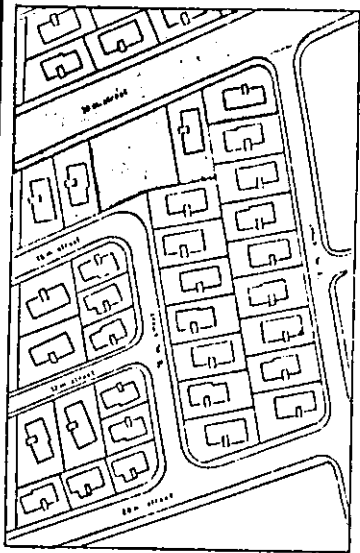
\* The existing solution of the Engineers Housing located at Umm-Al-Summaq area, showing the setbacks between the dwellings and the width and layout of local streets which act as a dividing line within the development.





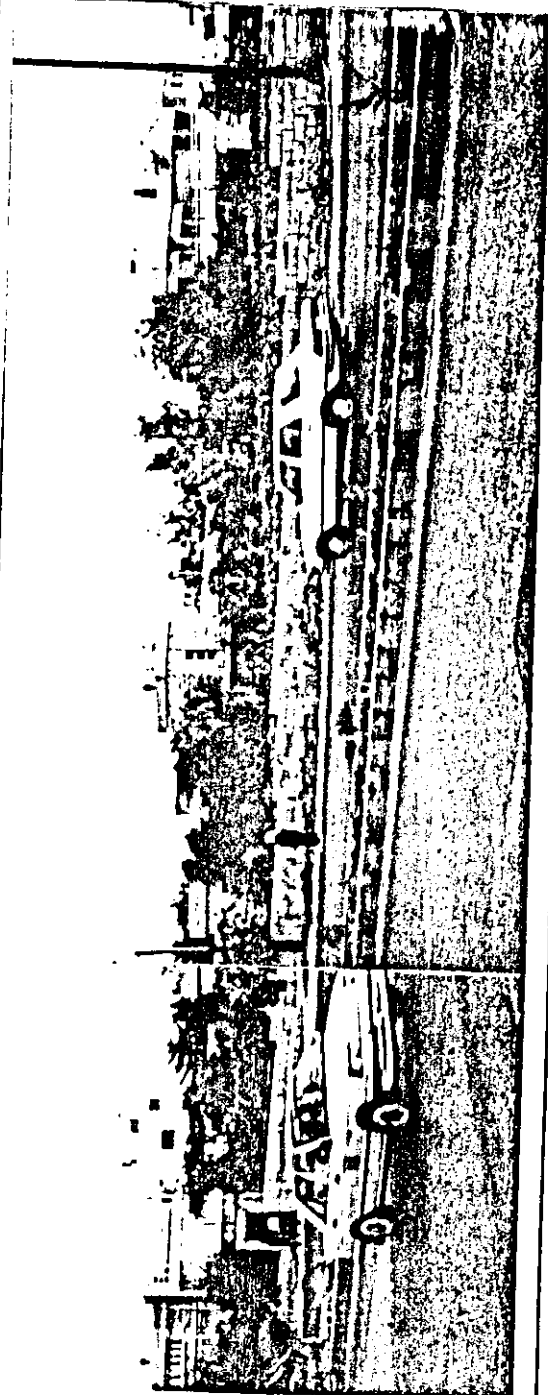
\* The disused derelict open space located at the end of the local street.





1- The minor-arterial street gives access to part of the existing dwellings, where sidewalks are used for car parking.

2- The derelict space viewed from the minor-arterial street.



- 4- Lot sizes range from about 500m<sup>2</sup> to 970m<sup>2</sup>. However, private open spaces are not distributed efficiently within each lot (Fig. 4.2), where side setbacks can only serve as passageways.
  - 5- The width of the local street is acting as a dividing line within the development, reducing social contact as well as increasing environmental noise pollution and traffic hazards.
  - 6- The study area does not accommodate any childrens' playgrounds or other community facilities. Thus, the local streets are the childrens' playgrounds.
  - 7- The study area has a derelict disused space of 1.7 dunums which adversely affects the visual and spatial qualities of the urban environment. Properly designed and located open areas would enhance the spatial environment, reduce the present monotony, and increase the vitality of the development.
- 4.4. Proposed Urban Design Solution.

Application of the recommended land-subdivision approach (see section 3.2.2) to the study area (Fig. 4.2) could result in a more efficient and better development. The proposed urban design solution comprises the following, (Fig. 4.4):

- 1- Providing a road-hierarchy within the area, in which dwellings are only accessible from existing collector-roads and the proposed cul-de-sacs with no access from the minor-arterial road. Emergency access and escape; fire, ambulance, reconstruction and repair to each proposed lot and open space is provided. This, will allow safer conditions, reduce the development cost and preserve the neighbourhood identity. This would also offer more efficient use of land and enhance the visual and spatial environment.
- 2- The use of cul-de-sacs coupled with the semi-public spaces at their ends would provide possible playgrounds, help in the creation of identity and the provision of semi-private open spaces.
- 3- The use of minimum street widths and lot frontages would reduce development cost, increase land utilization, reduce maintenance and allow for the provision of public and semi-public open spaces.
- 4- The use of smaller but more efficiently sub-divided lots would result in decreasing the initial as well as the maintenance costs per dwelling unit. The lot sizes may range from 350 to 500 m<sup>2</sup> for a single-family dwelling and about 800 m<sup>2</sup> for the 3-storey apartment



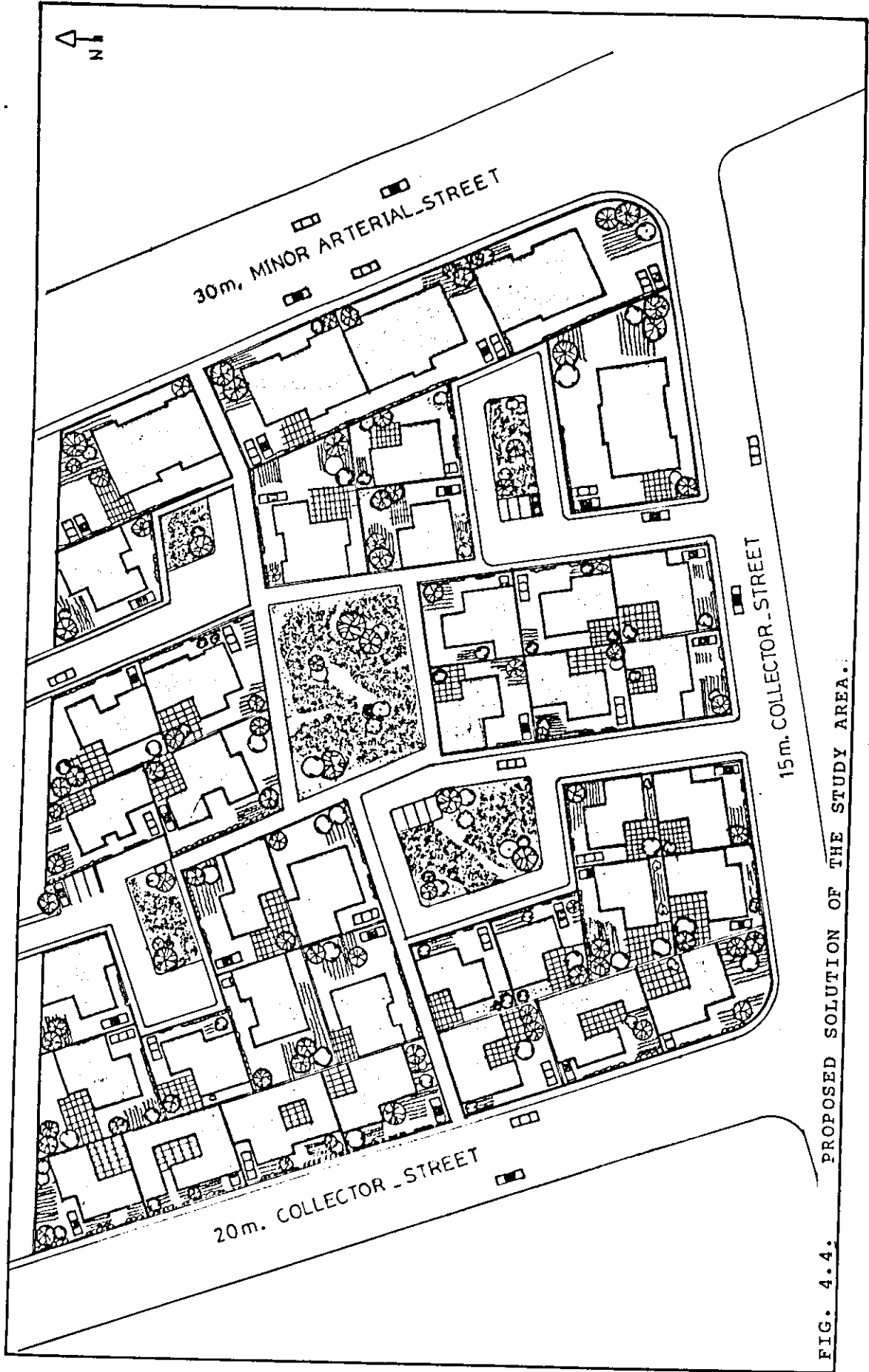


FIG. 4.4. PROPOSED SOLUTION OF THE STUDY AREA.

buildings, (Fig. 4.4). This will also allow for a variety of lot sizes to meet different site locations and conditions.

5- The use of various dwelling types would allow choice to match the different family needs, preferences, characteristics and corresponds with their traditions and habits. The atrium type can provide for privacy, besides an attractive transition of open spaces within the residential lot. The zero-lot-line will also be used, providing the pleasant use of outdoor private living areas. The 3-storey apartment building type with basement parking areas and shared landscaped open space could meet the requirements of different household sizes, beside creating a buffer-zone between the minor-arterial road and the rest of the development.

6- The lots located on the collector roads are to accommodate the atrium-type dwellings, providing better privacy from street traffic, private and on-street parking.

7- The lots located on the cul-de-sacs are to accommodate the zero-lot-line type of dwellings. Their courts may serve as playgrounds for small children. These dwellings are designed with private garages, while visitors may park within the semi-public space at the centres of the cul-de-sac ends.

in urban design for residential schemes. Accordingly, "Need" will refer to the outdoor residential requirements, i.e. residential dwelling units, open spaces, pathways, streets, playgrounds and parking requirements; "Context" will indicate the relationships between those elements and their surrounding in terms of privacy, views, accessibility, identity and preferences; and "Form" will be concerned with the effects of these elements on the overall visual and spatial environment with regard to variety, hierarchy, unity, zoning and enclosure. Thus, a modified evaluation matrix will be used to compare the existing and proposed solutions, considering the above mentioned headings and assessing them at the levels of: most satisfactory, average and minimal satisfaction.

A - NEED ASPECT:

Secondary Aspect	Existing Solution	Proposed Solution
<b>A.1 Residential lots</b> * Total number * Total area * Coverage * Size range	31 24 dunums 20% - 40% 500 - 970m2	41 23.47 dunums 33% - 55% 360 - 600 m2
<b>A.2 Circulation system</b>  * Streets (vehicles)  * Pathways (pedestrians)	Local streets  4 dunums, including 2m wide sidewalks. Some sidewalks have obstacles such as trees and parked cars on them.	Provides a street hierarchy and the use of cul-de-sacs with proper spaces for vehicular and pedestrian movements  2.35 dunums  230 m2
<b>A.3 Open spaces</b>  * Private * Semi-public * Public	only private space exist within lots.  17.8 dunums - 1.7 dunums (unused)	provides a hierachy of open spaces to serve the different levels of needs of various household types;  18.8 dunums 2.35 dunums 1.5 dunums
<b>A.4 Housing-types</b>	Similar and repetitive prototypes, yet within varying lot sizes.	Variety of house types (zero-lot-line, atrium and apartments) to meet different preferences and household sizes with lot sizes to match
<b>A.5 Vehicular access</b> * private garages  * inhabitants-parking  * visitors-parking	for each individual lot  on-street or side walks  on-street.	For zero-lot-line and atrium type of dwellings  For apartment buildings.  Included within the semi-public open spaces

A - NEED ASPECT:

Secondary Aspect	Existing Solution	Proposed Solution
A.6 Playgrounds	No existing playgrounds or public spaces.	Besides the public open space, additional playgrounds are located within the semi-public open spaces for easy supervision.
A.7 Safety conditions	Some lot frontages face the minor-arterial street, affecting safety and health.	Safety conditions are improved by preventing access from minor-arterial street and the use of road-hierarchy (cul-de-sacs).
	Conflict between the pedestrian and the vehicular movements	seperation between pedestrian movement and vehicular traffic.
A.8 Development cost	The wide streets, frontages, and inappropriate land distribution and utilization (unused public space and inefficient distribution of private spaces within lots) increase the development costs.	Development costs are reduced through maximum utilization of land; matching house types to lots; minimum frontages and the cul-de-sac arrangements.

Secondary Aspect	Existing Solution	Proposed Solution
B.1 Privacy	The adjacent lots directly overlook the surrounding setbacks, leaving no private space for household use.	Provides for privacy within the lot itself (courtyard, zero-lot-line house types).
B.2 Views	The lack of public or semi-public open spaces and the derelict disused space negatively affects the overall visual and spatial environment.	The variety of open spaces provided, enhance the visual and spatial environment and provides for nicer views.
B.3 Livability	<ul style="list-style-type: none"> <li>* Monotonous streets and building types.</li> <li>* No visual relief due to lack of open spaces.</li> </ul>	Cul-de-sac arrangement helps in providing different spatial layouts and visually interesting semi-public open space.
B.4 Identity	A typical lot layout and dwelling arrangement with similar identity to many other schemes.	The use of four cul-de-sacs, and three types of dwellings creates the opportunity to design spatially identifiable spaces.
B.5 Accessibility	The houses are typically accessible through arterial or local streets, which illustrates the current standard practice in land-subdivision and lot arrangements.	The dwellings are accessible through a road hierarchy i.e. cul-de-sacs allowing various approaches to lots. This allows for variety and enhances the visual and spatial characteristics of spaces and around dwellings.
B.6 Integrity	The width and layout of the local streets act as dividing lines within the development.	The use of the cul-de-sacs, coupled with the hierarchy of open spaces create an interesting movement pattern which links together all the physical and visual parts of the development.

C- FORM ASPECT:

Secondary Aspect	Existing Solution	Proposed Solution
C.1 Hierarchy	There are no hierarchies in open spaces nor in building heights, forms, layouts or accessibility	The hierarchy of streets, open spaces and dwelling heights, types and forms enhance the overall visual pattern and form of the development scheme.
C.2 Variety	All buildings and setbacks around them are of the same character which result in visual monotony and lack of spatial vitality.	Variety of dwelling types, lot sizes and open spaces enhance the visual variety of spatial forms and increase their vitality.
C.3 Image	The similarity of prototypes and spaces do not contribute to the total image of the scheme.	The use of a pedestrian link of open spaces within the scheme, enhances the image of the residential area.
C.4 Unity	The unbalanced distribution of lots and the location of the local streets disrupt the feeling of unity and belonging by dividing the scheme into three areas.	The balanced distribution of lots, open spaces and cul-de-sacs, help to integrate the dwelling clusters with their surrounding open spaces, creating unity throughout the development.

	NEED	CONTEXT	FORM
<p>● Most satisfactory</p> <p>◐ Average</p> <p>○ Minimal satisfaction</p>	Number of residential lots		
	Area of lots		
	Lot coverage		
	Circulation system		
	Open spaces		
	Housing types		
	Vehicular access		
	Playgrounds		
	Safety conditions		
	Development cost		
	Privacy		
	Views		
	Liability		
	Identity		
Accessibility			
Integrity			
Hierarchy			
Variety			
Image			
Unity			
Existing solution			
Proposed solution			

Evaluation Matrix :

Adapted from Paul lasseau's "Graphic Thinking for Architects and Designers", 1989



#### 4.6. Summary of chapter

The study area is the Engineers Housing Scheme located at Umm-Al-Summaq area. It was chosen for various reasons, but mainly because it is an example of one of the earliest large-residential subdivisions located at the outskirts of Amman, designed for owners-occupiers of similar socio-economic level and in accordance with the C sub-zone residential regulations.

A site survey and analysis was carried out for the existing solution. Allocation of uses, land utilization, socio-economic backgrounds, available services and the physical and spatial forms of the environment, were evaluated and the associated problems were identified. These were identified as: unbalanced distribution and inefficient land utilization (derelict disused open space and the set-backs around dwelling units); lack of public open spaces and playgrounds; lack of housing variety to satisfy different preferences and lot sizes; monotonous spaces and lack of identity, unity and safety conditions within the scheme.

A solution to the study area was proposed applying the recommended land-subdivision approach (see section 3.2.2). The proposal utilized: a road-hierarchy coupled

with the use of cul-de-sacs to create identity, livable areas and safety conditions; variety of lot sizes and house types to meet different preferences, household sizes and site location; a variety of open spaces to enhance the feeling of belonging and the visual and spatial environment; efficient land utilization and reduction of development costs by decreasing lot sizes and frontages and the use of cul-de-sacs to reduce the cost of infrastructure.

A design evaluation was carried out to compare the existing and the proposed solutions, and an evaluation matrix was prepared comparing the two solutions under the aspect headings of Need, Context and Form. This matrix showed the advantages of the proposed solution in creating a more efficient land utilization and livable large residential subdivisions, which meets the various household needs, preferences, and social behaviour within an enhanced visual and spatial urban environment.

References of chapter

- 1- Based on data from Greater Amman Comprehensive Development plan (1985-2005), P. 6.9.
- 2- Greater Amman Comprehensive Development plan (1985-2005), Fig.5.5.

## Chapter 5:

### CONCLUSIONS AND RECOMMENDATIONS.

The theoretical and practical investigation undertaken in this research work, pointed out to the following conclusions and recommendations:

#### 5.1. Conclusions

1. The analysis of land-subdivision patterns in history showed that the orthogonal grid and land parcelling by the rectangle were the dominant devices. However, land-subdivision controls dealing with minimum lot size and frontage had emerged after World War II. These constraints are still in use till today, (see chapter 1).
2. By the beginning of the 20th century, it was realized that building development is affected by the way the land is developed, and recently designers became aware that land-subdivision patterns have environmental, social and financial effects as well as spatial impact on the urban-built environment, (see section 3.1 and 3.2).
3. Amman's growth was partly due to the sudden increase in population, whereby land policies were later introduced to provide guidelines for its develop-

ment and to improve the situation resulting from the lack of land-subdivision controls. This situation resulted into an urban sprawl, at the outskirts of Amman, with large residential developments affecting the urban pattern (see section 2.1 and 2.2).

4. Land-subdivision controls in Amman deal with minimum frontage and lot area. They are in accordance with the prevailing land-subdivision controls during the 1950's and 1960's characterized by their rigid application. This situation affected large-residential subdivisions, where the present regulations do not specify or give guidelines for their development. They mainly develop according with regulations of individual land lots. This, in turn, affected land utilization and the pattern of adjacent land developments, (see section 3.3.1 and 3.3.2).

5. The visual and spatial study showed that land in Amman is not efficiently utilized; in terms of waste spaces around and in between the buildings, the lack of public open spaces and recreational facilities, the lack of street hierarchy, housing variety and neighbourhood identity, (see section 4.1). All of which is of a negative direct effect on the urban form. This verifies the first hypothesis proposed by this study that zoning ordinances control the shape and size of lots, land-uses, street hierarchies, open spaces and

other community facilities, all of which affects the urban form.

6. The current legislations in Amman, are not in accordance with needs, preferences and family income levels. This, in its turn, affects the way the land is utilized and developed, which verifies the second hypothesis, that is: land-subdivision regulations control the lot's size and accordingly the way it is developed, and that they affect the urban design and the spatial qualities of open spaces in residential environments.

7. The case study in Umm-Al-Summaq area illustrates that the proposed land-subdivision solution (see sections 3.2.2 and 4.5) where proper land utilization, road hierarchy, open spaces hierarchy combined with a variety of lot sizes and house types helped in creating identity, visual and spatial satisfaction and in reducing cost of development (see evaluation matrix in section 4.5).

## 5.2. Recommendations

1. Land-subdivision controls play a big role in shaping the urban form of our cities. However, it is still conducted by surveyors, while its importance require the collaboration of planners, architects and urban designers, as well as, surveyors in the sub-

division procedure to enhance and maintain the physical and spatial form of the urban environment.

2. Land development is dependent on land-subdivision ordinances and building regulations, thus, a re-evaluation of the current legislation is necessary to meet current needs, preferences, behaviour and household incomes and to create flexibility in applying these regulations. The aborted study of 1981 (see section 3.4) should be revived and its recommendations pursued (see Appendix VI).

3. It is important to accommodate guidelines for large-residential subdivisions in the current regulations. These could be developed by furthering the work done in the 1981 study (see Appendix VI) which will result in encouraging appropriate designs affecting the overall pattern of neighbourhood identity and the sense of belonging of its inhabitants and enhance the spatial urban form of the built-environment.

4. Open spaces are of importance in enhancing the visual and spatial qualities of any development. The lack of regulations specifying public open-space policies for residential clusters encourages the haphazard design and use of green and open areas. These open spaces would allow for outdoor activities, promote better living standards, increase safety conditions and the feeling of belonging and enhance the visual and perceptual qualities of the urban spatial form.

BIBLIOGRAPHYi. Books

- 1- Arnold, David The practice of local Government Planning. Washington: ICMO, 1979.
- 2- Bacon, Edmund Design of cities. London: Thames and Hudson, 1967.
- 3- Banz, George Elements of Urban Form. New York: McGraw-Hill Book Company, 1970.
- 4- Catanese, Anthony and James Snyder. Introduction to Urban Planning. New York: McGraw-Hill book Company, 1979.
- 5- Catanese, Anthony and James Snyder. Urban Planning. New York: McGraw-Hill book Company, (revised edition) 1988.
- 6- Catanese, Anthony and James Snyder. Introduction to Architecture. New York: McGraw-Hill book Company, 1979.
- 7- Chermayeff, serge and christopher Alexander. Community and Privacy. New York: Anchor, 1965.
- 8- Chiara, Joseph and Lee Koppelman. Urban Planning and Design Criteria. New York: VNR Company, 1982.
- 9- Cullen, Gordon The Concise Townscape. London: The architectural Press, 1971.
- 10- Davis, Sam The Form of Housing. New York: VNR Company, 1977.
- 11- Deilmann, Harald, G. Bickenbach and H. Pfeiffer. Housing Groups. Stuttgart: Karl Kramer Verlag, 1977.
- 12- Evans, Houghton Architechure and Urban Design. London: The constuction Press ltd., 1978.



- 13- Gallion, Arthur and  
Simon Eisner. The Urban Pattern. City  
Planning and design.  
New York: Company, 1963, 1986
- 14- Goethert, Reinhard  
and Horaic camions. Urbanization Primer. Mass-  
achusetts: MIT Press,  
1978.
- 15- Goodman, William Principles and Practice of  
Urban Planning. Wahington:  
ICMO, 1968.
- 16- Hakim, Besim Arabic-Islamic Cities.  
Building and Planning  
Principles. London: KPI,  
1986.
- 17- Krier, Rob Urban space. London: Academy  
editions, 1979.
- 18- Land design /  
research, inc.  
of Columbia,  
Maryland Cost effective. Site Plann-  
ing. Single family develop-  
ment. Washington D.C.: NAHB,  
1976.
- 19- Laseau, Paul Graphic Thinking for  
Architects and Designers.  
New York: VNR, 1989.
- 20- Lewis, Harold Planning the Modern City.  
Volume 1. New York: John  
Wiley & Sons, 1957.
- 21- Lewis, Harold Planning the Modern City.  
Volume 2. New York: John  
Wiley & Sons, 1949.
- 22- Lorenz, Victor Physical Planning in Jordan.  
Amman: Ministry of Muncipal  
and Rural Affairs, 1968.
- 23- Luchinger, Arnolf Structuralism in  
Architecture and urban  
planning. Stuttgart: Karl  
Kramer Verlag, 1981.
- 24- Lynch, Kevin  
and Gary Hack. Site Planning. Massachuse-  
tts: MIT Press, 1984.

- 25- O'Mara, W. Paul Residential Development Handbook. Washington D.C.: ULI, 1978.
- 26- Osborne, christine An Insight and Guide to Jordan. London: Longman group limited, 1981.
- 27- Owens, Susan Energy planning and urban form. London: Pion limited, 1986.
- 28- Rapoport, Amos Human Aspects of Urban Form. Towards a Man-environment approach to urban form and design. New York: Pergamon Press, 1977.
- 29- Rasmussen, steen Towns and Buildings. Massachusetts: MIT press, 1951.
- 30- Serageldin, Ismail and Samir El-Sadek. The Arab city. Its character and Islamic cultural Heritage. Riyadh: AUDI, 1982.
- 31- Shirvani, Hamid The Urban Design Process. New York: VNR, 1985.
- 32- Sir Banister Fletcher's A History of Architecture. London: The Anthelone Press, 1975.
- 33- Steadman, philip, and D. Hawkes and and J. Owers and P. Rickaby Energy and urban built form London: Butterworths, 1987.
- 34- United Nations Center for human settlements (HABTTAT) Global Report on Human Settlements, 1986. New York: Oxford University press, 1987.
- 35- Untermann, Richard and Robert Small Site Planning for cluster Housing. New York: VNR, 1977.
- 36- Urban land Institute The community Builders Handbook. Washington D.C.: ULI, 1950.

iv- References in Arabic Language

أ- الكتب:

- ١- أمانة عمان الكبرى ، عمان عاصمة الأردن ، ١٩٨٨ . عمان : أمانة عمان الكبرى ، ١٩٨٨ .
- ٢- غالب بقاعين ، التخطيط القومي الشامل ومشكلات النمو الحضري في المدن . عمان: أمانة العاصمة ، ١٩٧٥ .
- ٣- محمود العابدي ، عمان في ماضيها وحاضرها . عمان: أمانة العاصمة ، ١٩٧١ .
- ٤- مجموعة من قوانين وانظمة امانة العاصمة ، ١٩٨٠ . عمان: أمانة العاصمة ، ١٩٨٠ .

ب. المجلات:

- ١- غالب بقاعين "التجربة الاردنيه في التخطيط التنموي" . المهندس الأردني ، رقم ٢٦ ، (شباط ، ١٩٨٢) .
- ٢- خالد البوريني ، "شريعات البناء والتنظيم" ، المهندس الأردني ، رقم ٢٨ (كانون أول ، ١٩٨٢) .
- ٣- شكري قبعين ، "التنظيم الاقليمي في الأردن" ، المهندس الأردني ، رقم ٢٧ ، (تشرين أول ، ١٩٦٨) .
- ٤- د. محمد خير ياسين ، "تاريخ الأردن عبر آثارة ما بين ٨٠٠٠ و ٦٠٠٠ قبل الميلاد" ، العمران ، رقم ٦٣ ، ١٩٧٧ .

ج. معلومات شفهيته أبحاث غير منشوره:

- ١- مسودة مشروع نظام التنظيم والابنيه ، وزارة الشؤون البلدية والقروية والبيئه ١٩٨١ .
- ٢- أمانة عمان الكبرى عمان ، ١٩٨٩ .
- ٣- وزارة الشؤون البلدية والقرويه والبيئه ، ١٩٨٩ .
- ٤- دائرة الأراضي والمساحة ، ١٩٨٩ .

د. القوانين والانظمة:

- ١- قانون التقسيم ضمن مناطق البلديات رقم (١١) لسنة ١٩٦٨ .
- ٢- قانون الاستملاك رقم (٦) لسنة ١٩٨٠ .

قانون مؤقت رقم ( ٧٩ ) لسنة ١٩٦٦  
قانون تنظيم المدن والقرى والأحياء

كما نشر في عدد الجريدة الرسمية رقم ١٩٥٢ الصادر بتاريخ ١٩٦٦/٩/٢٥ مع كالة  
تعديلاته حتى تاريخ ١٩٧٩/١٢/٣١ .

**وأحياء الأريزر**

- المادة ٤ - ١ - يكون من واجبات الأريزر تأمين سائر الأمور التالية في كاتبة اتحاء الملكة :
- أ - تسيق استئصال تنظيم جميع الأراضي في الملكة لاحسن وجه مسن وجوه الملحة العامة .
  - ب - ان يكون استئصال تنظيم جميع الأراضي منسجما مع مخطط التنظيم الاتصالي والحكومي .
  - ج - ان يكون تنظيم كاتبة المدن والقرى متشجبا مع سياسة الحكومة الاجتياحية والتطور في المجمع والتوسع به .
  - د - مراعاة لجنة تنظيم المدن المحلية واللوائية ولجان تنظيم المدن المشتركة وتوجيهها وتنظيم النصح لها والتأكد من ان اعمالها وتراراتها متفقة مع القوانين .
  - هـ - اعلان مناطق تنظيم المدن والقرى وتوسيعها والتاؤها بتوسيمية من مجلس التنظيم الاعلى .

**مجلس التنظيم الاعلى**

- المادة ٥ - ١ - يشكل مجلس التنظيم الاعلى على النحو التالي :
- أ - الوزير ويكون رئيسا للمجلس .
  - ب - امين العاصمة ممثلا عن البلديات .
  - ج - وكيل وزارة الاصحغال العامة .
  - د - الامين العام لمجلس الاعصار الاردني .
  - هـ - مدير مؤسسة الاسكان .
  - و - مدير تنظيم المدن والقرى .
  - ز - رئيس البلديات العامة .
  - ح - نقيب الهندسين .
  - ط - وكيل وزارة المحنة .
- ٢ - يؤلف التسلب القانوني لهذا المجلس من خمسة اعضاء واذا تساوت الاصوات فيكون للرئيس صوت ثان او صوت مرجح .
- ٣ - يتولى الاعضاء انتخاب اقدمهم ليؤولى رئاسة المجلس في حلقة غياب الرئيس .

**سلطة مجلس التنظيم الاعلى**

- المادة ٦ - ١ - يكون من واجبات مجلس التنظيم الاعلى :
- أ - اعلان مناطق تنظيم المدن وتوسيعها وتعديلها .
  - ب - اقرار مخططات التنظيم الاطبية ومخططات التنظيم البيئية .
  - ج - اصدار الامر بإنشاء او تعديل اية رخصة صدرت بمقتضى هذا القانون اذا تبين له انها قد صدرت بوجه غير مشروع وانها مخالفة لمخططات الاعمار والانتظمة والوامر والتعليقات .

- د - اصدار الامر بإنشاء او تعديل اية رخصة صدرت لتسيير ارض السى الذى الذي يراه مناسباً وذلك في الحالات التالية :
- ١ - في الحالة التي يتعلق الترخيس بمصلحة انشاء الابنية او لية عمليات اخرى على ان يكون ذلك تيل الاتناء من هـ هذه المصلحة .
- ٢ - في الحالة التي يتعلق الترخيس بتغيير استئصال الارض شريطة ان لا يؤثر هذا الاتناء او التعديل على عملية انشاء البناء او اية عملية اخرى تاتى اجرا .
- ويشترط انه اذا لم يزل اي ترخيص لتسيير ارض باهر صدر بمقتضى هذه المدة فحينئذ ولدى تقديم طلب الى الوزير خلال ثلاث اشهر من تاريخ بليغه هذا الامر بين المصاريف التي تكدها كل ذي مصلحة في هذه الارض بسبب البدء في تسييرها او بسبب الخسارة التي لحقت به من جراء هذا الاتناء او التعديل على الوزير ان يؤخر الى لجنة تنظيم المدن التي اصدرت الرخصة على الوزير هذا التعرض او الاتئصاص تعويضا عدلا عن تلك المصاريف .
- والخسارة غير انه لا يقع تعويض بشأن اية خسارة تقع من هبوط قيمة الاتئضاع بالارض بسبب الاتئناء او التعديل .
- هـ - النظر في اي استئناف ضد قرار لجنة الراء بمقتضى هذا القانون .
- و - اقرار مشاريع الانتظمة والقوانين التي تصنها دائرة التنظيم والتمتعة بشؤون التنظيم .
- ز - تعيين امين سر له يكون مسؤولا عن تسجيل وقشع وترارات المجلس وحفظها .

**دائرة تنظيم المدن والقرى المركزية**

- المادة ٧ - ١ - تشكل دائرة تصرف بدائرة تنظيم المدن والقرى المركزية في وزارة الداخلية للشؤون البلدية والتربية وتارسر الصلاحيات التالية :
- أ - اجراء المسح الطبقي والمسح الاجتياحي اللازمين لتحقيق اهداف تنظيم المدن والقرى .
  - ب - تحضير مخططات التنظيم الاطبية لجميع الوية الملكة .
  - ج - تحضير مخططات التنظيم الهيكلية للمدن حيث لا توجد لها مثل هذه المخططات .
  - د - المساعدة وتنظيم النصح لسلطات تنظيم المدن المحلية لاحداث تغيير في مخططات تنظيمها الهيكلية لتنضجها ظروف تطور المدينة او احوال تعديلات جبرية عليها وفي اجراء المسح الطبقي والاجتياحي اللازمة لها .
  - هـ - تزويد لجان تنظيم المدن اللوائية المشتركة بالخبرة الفنية التي يتعلق بمراقبة التنظيم والاعمار .

### لجنة تنظيم المدن الحلية

المادة ٩ - ١ - ١ - يجوز للوزير بمقتضى توجيه مجلس التنظيم الاعلى وبناء على

تسليم المدير ان يصدر امرا بمقتضى احكام هذا القانون  
يقضي باعتبار منطقة اي مركز محافظة او لواء منطقة تنظيم.  
فإذا صدر مثل هذا الامر يكون مجلس بلدية تلك المنطقة هو  
اللجنة الحلية لتنظيم والبنية في منطقة التنظيم المذكورة .

ب - يجوز للوزير بمقتضى توجيه مجلس التنظيم الاعلى وبناء  
على تسليم المدير ان يصدر امرا بمقتضى احكام هذا القانون  
يقضي باعتبار اية منطقة عدا مناطق مراكز الالوية منطقة  
تنظيم فإذا كانت تلك المنطقة تشمل على منطقة بلدية او على  
قسم من منطقة بلدية يكون مجلس تلك البلدية هو اللجنة  
الحلية للتنظيم والبنية في منطقة التنظيم المذكورة الا اذا اوزر  
الوزير بخلاف ذلك بناء على طلب رغبته اليه لجنة اللواء في  
ذلك الشأن .

ج - يجوز للوزير بمقتضى توجيه مجلس التنظيم الاعلى وبناء على  
تسليم المدير ان يصدر امرا بمقتضى احكام هذا القانون  
يقضي باعتبار اي منطقة تنظيم تشمل على منطقة مجلس  
قروي او قسم من منطقة مجلس قروي ويكون ذلك المجلس  
القروي هو لجنة التنظيم الحلية في منطقة التنظيم المذكورة  
اذا اوزر الوزير بخلاف ذلك بناء على طلب رغبته اليه لجنة  
الواء بذلك الشأن في تلك المنطقة .

د - ١ - اذا اصدر الوزير بمقتضى احكام هذا القانون امرا  
يقضي بعدم اعتبار مجلس البلدية لجنة محلية للتنظيم  
لمنطقة "التنظيم المذكورة" فعندئذ تترك لجنة التنظيم  
والبنية الحلية مما يلي :  
١ - الحاكم الاداري للمنطقة ويكون رئيسا للجنة .  
٢ - رئيس البلدية .  
٣ - شخص يسميه لجنة الاسراء .  
٤ - شخص يسميه لجنة الاسراء .  
٥ - ممثل وزارة الصحة .  
٦ - مهندس البلدية ( ان كان البلدية مهندس ) او  
مهندس دائرة التنظيم .

ب - اذا اصدر الوزير امرا بمقتضى احكام هذا القانون يقضي بعدم  
اعتبار المجلس القروي لجنة تنظيم الحلية لمنطقة  
التنظيم المذكورة فعندئذ تترك لجنة التنظيم الحلية  
مما يلي :

و - تحضر انظمة نموذجية تتناول مختلف شؤون تنظيم المدن  
والقري والبنية تتخذ اساسا في سن انظمة خاصة ضمن  
حدود مختلف مناطق التنظيم في المملكة .

٢ - ١ - يراس هذه الدائرة شخص اخصائي في تنظيم المدن وذو  
خبرة ودراية واسعة في مشاكل تنظيم المدن ويعرف لاغراض  
هذا القانون بالمدير ويعمل كمستشار نفي للوزارة في شؤون  
التنظيم .

ب - يتم المدير بالتسليم للوزير فيما يتعلق بتعيين خبراء التنظيم  
او المؤسسات الاستشارية المذكورة .

### لجنة تنظيم المدن والقري والبنية الالوية

المادة ٨ - ١ - يشكل في كل محافظة لواء لجنة تعرف بلجنة تنظيم المدن والقري  
والبنية الالوية تتالف مما يلي :

- ١ - المحافظ او التصرف ويكون رئيسا للجنة .
  - ب - النائب العام في عمان والقدس والدمشق العام في مراكز الالوية .
  - ج - ممثل وزارة الاصحى العامة في اللواء او المحافظ .
  - د - ممثل دائرة تنظيم المدن والقري المركزية .
  - هـ - مدير الصحة في اللواء او المحافظة .
  - و - ممثل لجنة التنظيم الحلية حين النشر في الامور التي تتعلق بها .
- ٢ - يؤلف النصاب القانوني لهذه اللجنة من اربعة اعضاء واذا تساوت  
الاصوات فيكون للرئيس صوت ثان او صوت مرجح .

٢ - تشمل واجبات لجنة تنظيم المدن والقري الالوية ما يلي :

- ١ - الموافقة على مخططات التنظيم التنصيلية .
- ب - النظر في الاعتراضات التي تقدم على مخططات التنظيم  
الاطمية والبلدية والتنصيلية في مخططاتها ورفع توصياتها  
بذلك الى مجلس التنظيم الاعلى .

ج - النظر في اي استئناف يقدم اليها ضد قرار لجان تنظيم المدن  
الحلية في مخططاتها ويكون قرارها بشأن ذلك نهائيا . غير انه  
اذا اختلفت اللجان فيحق للجنة الحلية ان ترفع هذا الاختلاف  
الى مجلس التنظيم الاعلى ويكون قراره بشأن ذلك نهائيا .

د - اصدار الاوامر واخطارات التنفيذ حينما تمارس لجنة اللواء  
سلطات اللجنة حسب القانون .

٤ - تمارس لجنة اللواء بالاضافة الى صلاحياتها ومهامها جميع صلاحيات  
ومهام اللجنة الحلية بشأن منطقة التنظيم الاطمية والقري الواتمة  
ضمن اللواء المؤلفة فيه لجنة اللواء المذكورة .

ب - إذا لم تكن اللجنة المحلية لاية منطقة تنظم مؤلدة بمتنفس هذه المادة هي مجلس البلدية او المجلس القروي القائم في تلك المنطقة يجوز للوزير ان يصدر تعليمات ييسر تبنيها الطريق التي ينبغي على اللجنة المحلية ان تتبعها في ممارستها للمهام والصلاحات المخولة لها بمتنفس هذا القانون ويجوز للوزير بصورة خاصة ودون اجحاف بالمسئبة العامة التي تطسوي عليها الصلاحية الاثمة الذكر ان يصدر تعليمات تبين كيفية تحصيل الاموال او الرسوم المستحقة للجنة وطريقة تدبيرها المصاريف التي تنفقها وكيفية ائانة ملكة اية ارض تحزرها في سياق ممارستها تلك الصلاحية .

٤ - يجوز للوزير بتوسية مجلس التنظيم الاعلى اتخاذ الاجراءات اللازمة لتنظيم القرى التي يوجد بها مجلس قروي ووضع الترتيبات لتنظيم ذلك .

لجان التنظيم المشتركة

المادة ١٠-١ - يجوز للوزير ان يامر بتأليف لجنة مشتركة للتنظيم والانية لاية منطقة من المناطق التي تشمل على منطقتين او اكثر من مناطق التنظيم

المحلية او الاقليمية بناء على تشييب المدير وتؤلف هذه اللجنة المشتركة وفقا لما يلي :-

- ١ - تؤلف اللجنة المحلية المشتركة من عضو واحد على الاقل من اعضاء اللجنة المحلية الواحدة في تلك المنطقة لكل منطقة من مناطق التنظيم بالاضافة الى اي شخص او اشخاص اخرين قد يعينهم الوزير من ذوي الاختصاص او الخبرة .
- ب - تؤلف اللجنة الوالية المشتركة من عضو واحد على الاقل من اعضاء اللجنة الوالية الواحدة في تلك المنطقة لكل منطقة من مناطق التنظيم بالاضافة الى اي شخص او اشخاص اخرين قد يعينهم الوزير من ذوي الاختصاص او الخبرة .
- ٢ - يتألف اللجنة المشتركة جميع الصلاحيات ومسؤوليات اللجنة المحلية او الوالية .
- ٣ - يعين الوزير رئيس اللجنة المشتركة في كلتا الحالتين .

- ١ - الحاكم الاداري ويكون رئيسا للجنة .
- ٢ - رئيس المجلس المحلي .
- ٣ - شخص يسيبه المجلس المحلي .
- ٤ - شخص تشييبه لجنة السراء .
- ٥ - ممثل وزارة الصحة .
- ٦ - مهندس المجلس المحلي ( ان كان كان للمجلس مهندس ) او مهندس دائرة التنظيم .

هـ - بالرغم مما ورد في قانون البلديات او اي قانون اخر يكون التصاب القانوني للجنة المحلية من نصف الاعضاء زائد واحد واذا تساوت الاصوات يكون للرئيس صوت ثاني او صوت مرجح .

٢ - تتخذ اللجنة المحلية وفقا لاحكام هذا القانون جميع التدابير الضرورية لتأمين تنفيذ ومراعاة احكام هذا القانون او اي مشروع مقرر واحكام اي نظام صدر او يعتبر انه صدر بمتنشاء ويكون من واجباتها كذلك .

١ - تحضو مخططات التنظيم الهيكلية والتعميلية ولها ان تطلب المساعدة الفنية لذلك من دائرة التنظيم .

ب - التصديق على مخططات التتسيم حسب مخططات التنظيم الضرورية .

ج - اصدار رخص الامار والانية وفقا للقانون .

د - مراعاة اعمال الاعمار والانشاءات ضمن مخفتها والتأكد من مطابقتها للشروط المرخصة واحكام هذا القانون .

هـ - اصدار اخطارات التنفيذ وتأمين تنفيذها .

و - تنظيم انشاء الابنية وعمدها وتوسيع الطرق او تشييبها وسائر الامور المنصوص عليها في احكام هذا القانون .

٢-١ - اذا كانت اللجنة المحلية لاية منطقة تنظيم بمتنفس هذه المادة هي مجلس البلدية او المجلس القروي القائم في تلك المنطقة يمارس ذلك المجلس في منطقة التنظيم المذكورة جيبسج الصلاحيات المخولة للجنة المحلية بمتنفس هذا القانون وتنفذ الاموال او الرسوم الواجبة الدفع للجنة المحلية الى صندوق البلدية او المجلس القروي وتدفق المصاريف التي تنفق في هذا الشأن من ذلك الصندوق ، وان كان قسم من منطقة التنظيم المذكورة يقع خارج منطقة البلدية او منطقة المجلس القروي حسبها تكون الحال .

٦ - بغض النظر عما ورد في اي قانون اخر لا يسمح بتقسيم اية ارض مبنية او خالية من البناء بشكل يخالف احكام تنظيم المنطقة الواضحة بها .

#### تصديق مخططات التقسيم

١ - تقدم كافة مخططات التقسيم من اجل تصديقها الى لجنة تنظيم المدن الحبلية .

٢ - اذا وافقت اللجنة الحبلية على مخطط تقسيم نفذ اللجنة الحبلية الاجراءات لكتابة بيان على الصفحة الاولى موقع من رئيسها ينبغي ان تتضمن هو وفق مخطط التنظيم التفصيلي المقرر الذي ينطبق على المنطقة الواضحة فيها الارض التي يتعلق بها مخطط التقسيم وان تتضمن قد وافقت عليه اللجنة الحبلية ويرتب بعدئذ على مأمور تسجيل الاراضي بناء على طلب مقدمه مالك تلك الارض ان يسجل التقسيم الموافق عليه في سجلات الاراضي .

#### تعديل مخططات التقسيم

٣٠-١ - يجوز للجنة تنظيم المدن الحبلية بعد ارسالها اشعارا الى مالك اية ارض يتعلق بها اي مخطط تقسيم تعمله فيه بعرضها على تعديل او ايقاف العمل بمخطط التقسيم المذكور او الغائه وبعد ان تكون قد نظرت في اي اعتراض يقدمه اليها المالك خلال شهر واحد من تاريخ اشعاره بذلك ، ان تعال او توقوف العمل بمخطط التقسيم المذكور او طغيه .

٢ - اذا عدلت لجنة التنظيم الحبلية مخطط التقسيم او اوفنت العمل به او الغته بمقتضى الفقرة (١) من هذه المادة يترتب عليها ان ترسل الى مأمور دائرة تسجيل الاراضي كتابا بذلك الشأن موقعا من رئيسها ويرتب على هذا المأمور حين استلامه ذلك الكتا بيان يتخذ التدابير اللازمة لاجراء التويد المتضاه في سجلات الاراضي .

٣ - اذا وجدت قطعة ارض او قطع اراضي غير منظمة الشكل وبذلك لا تصلح لاداءه بناء مناسب عليها او كانت مساحتها اقل من الحد الأدنى المسموح به فيحق للجنة الحبلية عدم اعتبار قطع الاراضي المذكورة صالحة للبناء وان تقوم سواء بنفسها او بالاتفاق مع المالكين والمالكين الجاورين بعمل مخطط تقسيم لتلك الاراضي جميعها يكون مطابقا لمخطط التنظيم التفصيلي المقرر ويرتب بعدئذ على مأمور تسجيل الاراضي بناء على طلب من اللجنة الحبلية موقع من رئيسها او طلب مقدمه مالك او مالكو الارض ان يسجل التقسيم في سجلات الاراضي وان يلبي التسجيلات القديمة فيما اذا وجدت وتجري تسوية على اساسه بين المالكين .

#### مخططات تقسيم الاراضي

٢٨-١ - على الرغم مما ورد في اي قانون او تشريع اخر لا يجوز لأي شخص ان يقسم اية ارض او يسجل في سجل الاراضي اي تقسيم لارض واحدة في منطقة تنظيم الي قطع تمل مساحة اية قطعة منها عن عشرة دونات متتية الا بهتفسي مخطط تقسيم توافق عليه اللجنة الحبلية وكل تقسيم لارض واحدة في منطقة تنظيم وكل تسجيل يجري بشأنها خلافا لاحكام هذه المادة يعتبر باطلا سواء كان هنالك مشروع تنظيمي مقرر ام لا طالما وان المنطقة معتمة بمنطقة تنظيمية وتعتبر جميع القرارات الصادرة عن اللجنة المختصة بهذا الصدد قطعية وغير خاضعة لاي طريق من طرق الطعن .

٢ - كل مخطط تقسيم بشأن ارض واحدة في منطقة تنظيم يجب ان يكون مطابقا لمخطط التنظيم التفصيلي المصدق لتلك المنطقة وغير قابل للطعن .

٣ - يجب ان يبين على مخطط التقسيم حدود قطعة الارض التي من اجها نظم هذا المخطط وكذلك الطرق المترة على مخطط التنظيم التفصيلي للمنطقة التي تقع فيها هذه الارض والطرق المقترحة لخطوط الارتعاشات المتساوية واية امور اخرى قد تتطلبها لجنة تنظيم المدن الحبلية من اجل التثبيت من مطابطة مخطط التقسيم لمخطط الاعمار التفصيلي المقرر ويشمل ذلك كافة الامور المدرجة والنصوص عليها في الفقرة الخامسة من المادة (٢٣) من هذا القانون .

٤ - يجوز لمالك اية ارض واحدة في منطقة ينطبق عليها مخطط تنظيم مقرر ويرتب عليه اذا ما كلفته اللجنة الحبلية بالتسليم لتلك الارض اللجنة خلال الة المذكورة في الاشعار بمخطط تقسيم لتلك الارض من اجل موافقتها عليها . ويشترط في ذلك انه في حالة امتناع مالك اية ارض عن تنفيذ طلب اللجنة الحبلية خلال الة المقررة بالاتسار يجوز لها ان تعهد لمن تشاء ان يقوم بتخصيص مخطط التقسيم المطلوب على نفقة المالك وتستوفي كافة الرسوم والتكاليف في مثل هذه الحالة بنفس الطريقة التي تستوفي فيها ضرائب البلدية .

٥ - يترتب ان تكون كل تسمية من القسام المبنية على مخطط التقسيم واقعة على طريق مقرر او مقترح بنال موافقة اللجنة الحبلية .

### اللجنة المحلية أن تخطط التزاميا بعض المناطق

المادة ٢١- ١ - يجوز للجنة المحلية من حين لآخر أن تتخذ قرارا بموافقة لجنة اللواء بأعادة تخطيط اية منطقة لم يجر تخطيطها وفقا لاي مخطط تنظيمي مقرر ينطبق عليها او بأعادة تخطيط اية منطقة كانت في الامس قد خُطبت وفقا لمخطط تنظيمي مقرر ؛ الا انه لم يعد تخطيطها وفقا لاي تعديل ادخل على منطقة الاعمار المذكورة او وفقا لاي مخطط تنظيمي استعفيش به عنه فاذا اتخذت اللجنة المحلية مثل هذا القرار يتوجب عليها ان تقوم بتخصيص مخطط تنظيم المنطقة المذكورة يتناول تنظيم يتناول تخصيص قطع اراضي (بشار اليها فيما يلي بالقطع الجديدة) لجميع الذين يملكون اراضي في تلك المنطقة منفردين او مجتمعين ( ويشار الى هذه الاراضي فيما يلي بالقطع الاصليية ) التي تكون بسبب شطبها او موقتها او مساحتها او لاي سبب باخر مطابقة لذلك المخطط الثمر او التعديل الذي ادخل عليه او المخطط الثمر الذي استعفيش به عنه حسبها تكون الحال وتقع على اقرب مسك يمكن في جواز القلع الاصلي للباكين الذين خصصت لهم تلك القطع قبل انتفاع اي قسم منها على ان لا تتجاوز نسبة الانتفاع ٢٥ / من مساحتها لاية شاية من الشايات المعنية في قانوني التقسيم والاستهلاك ومساوية في مجموع مساحتها باقرب ما يمكن لاجوع مساحة القطع الجديدة المعادة للمالكين الذين خصصت لهم قطع الاراضي الجديدة باسم ملك او باسماء مالكي القطع الاصليية الذين خصصت لهم وتسجيلها باسمه وباسمائهم في سجلات الاراضي بالاشارة الى الانتفاع المذكور فيما يصبح في الامكان اعادة تخطيط تلك المنطقة .

٢ - تتبع ذات الاجراءات المنصوص عليها في المادة (٢٤) من هذا القانون في ايداع الاعتراضات والنظر في اقرار المخطط ووضعه موضع التنفيذ .



## Appendix II

Land-subdivision standards in 1950 and 1978, according to Urban Land Institute, Washington D.C.

- Source: 1. ULI, Community Builders Handbook, 1950.  
2. O'Mara, Residential Development Handbook, 1978.

(b) Lot Lines. The laying out of lots should not be done casually or left wholly to your engineer. Careful restudy of lot lines with due regard for topography can frequently result in thousands of dollars increased value by the creation of more desirable and usable home sites. This is more often possible where lots are larger with more flexibility in lot line location, but should by no means be overlooked in close development. Qualities which should be sought in lot layout as determined by lot line location should include:

1. A favorable site for placing the house. The question should always be asked—"Does the lot contain a good house site?"
2. Usable land to front and rear for lawn, garden, etc.
3. Adequate surface drainage away from house location with slopes generally toward the street or rear, with reasonable grade for garage and driveway approaches from the street.
4. Minimum amount of grading and retention of trees beyond the house location.

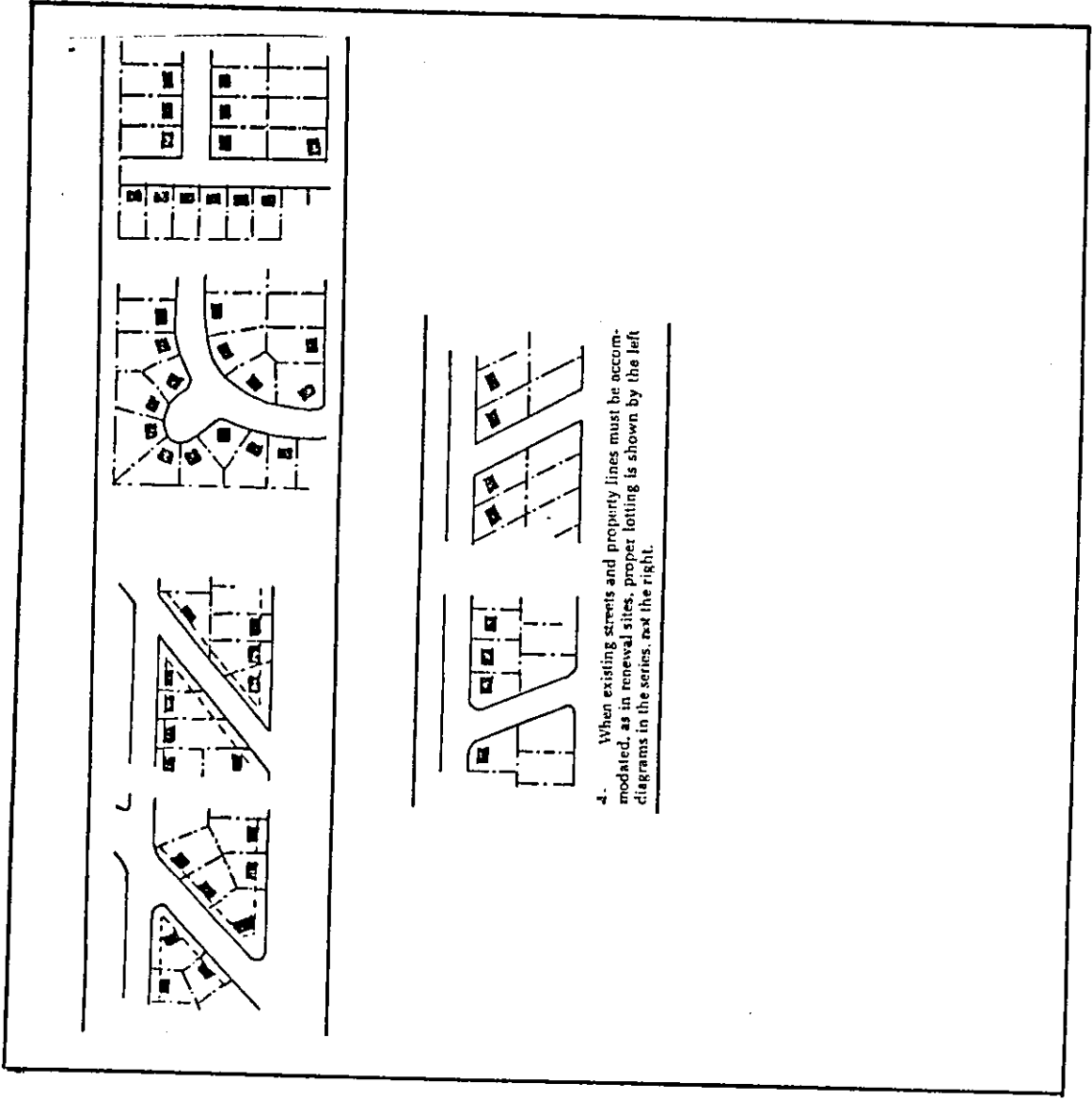
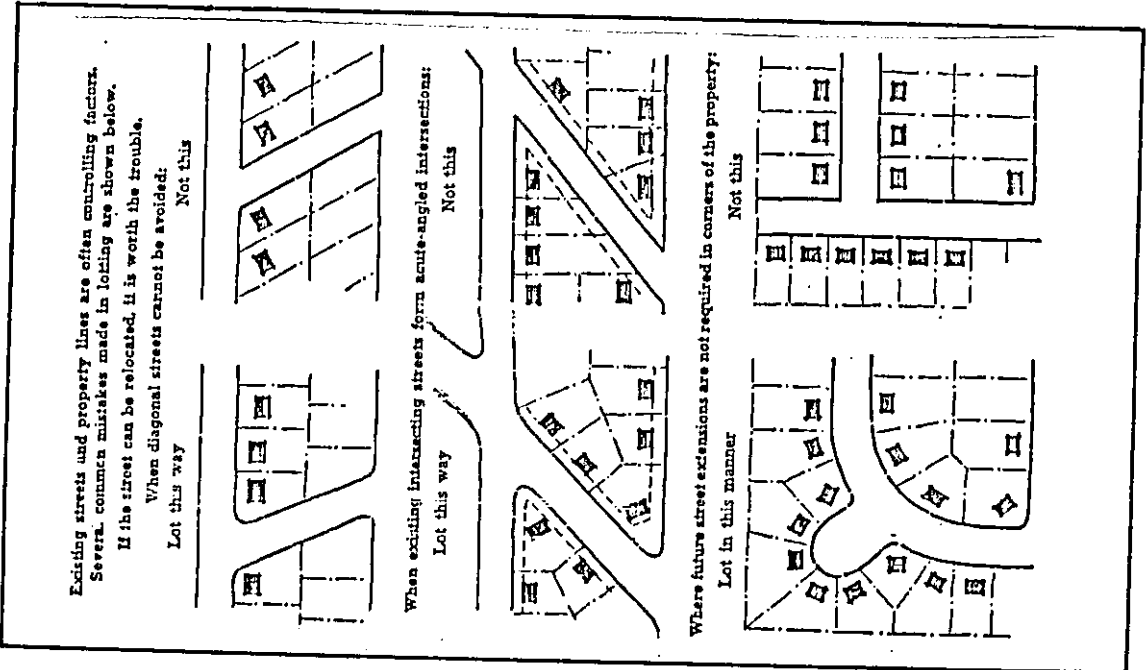
Corner lots should be from 10 to 20 per cent wider than interior lots in order to provide an adequate yard space on the side street.

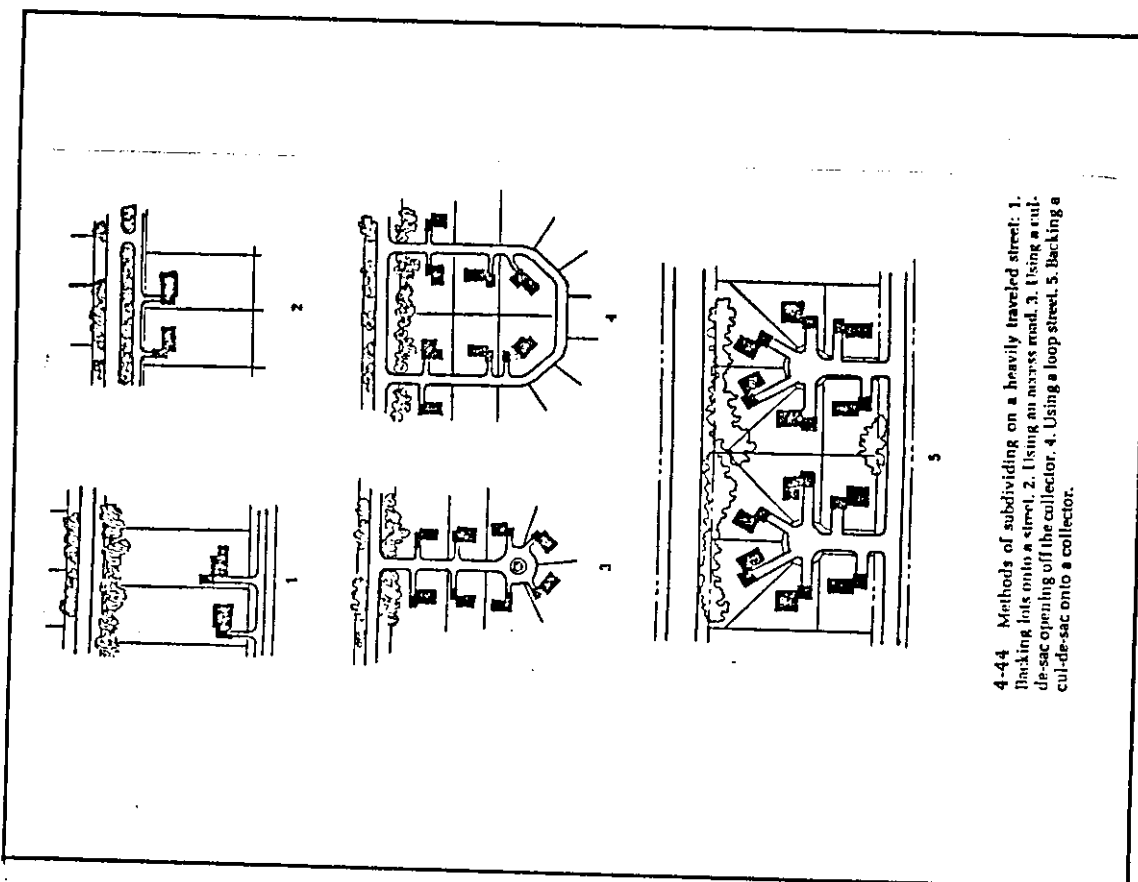
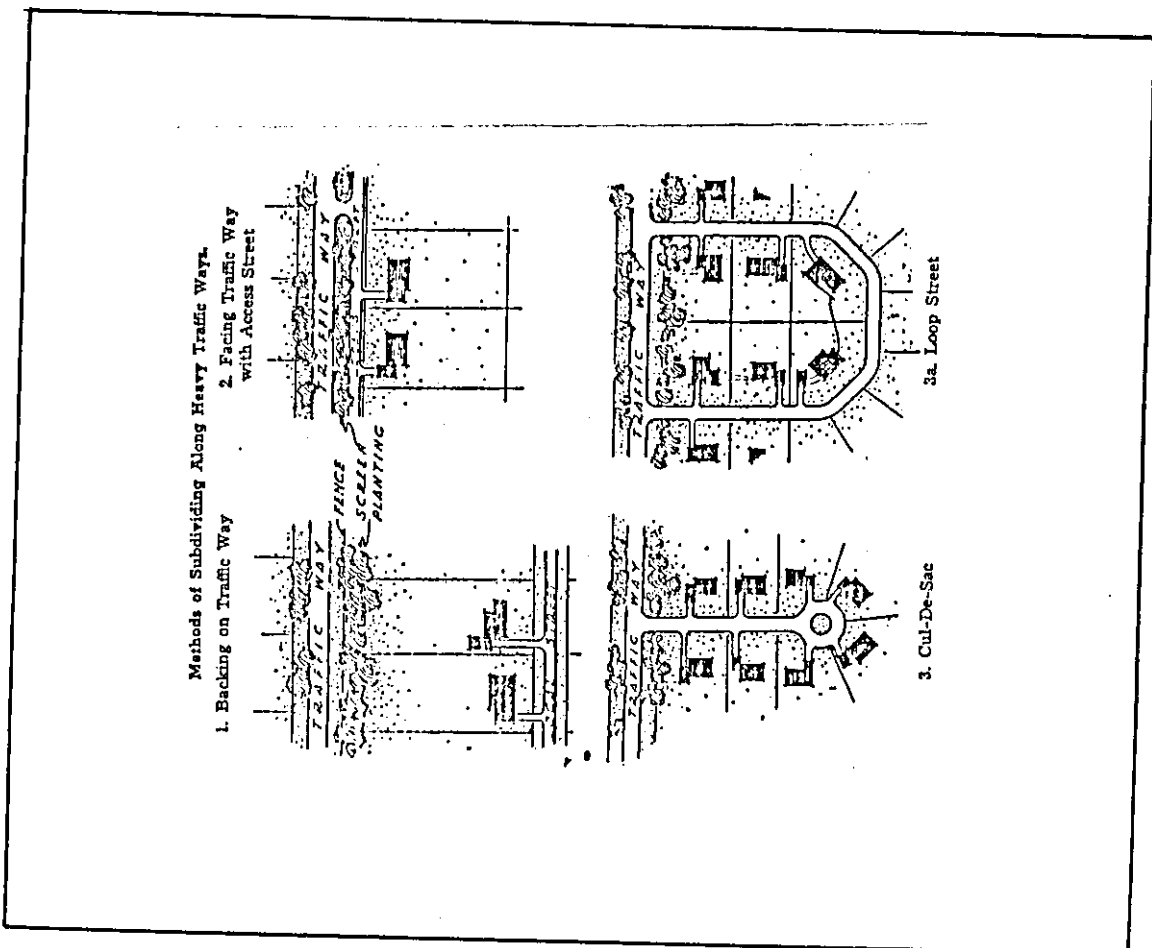
## Lot Lines

The laying out of lots should not be approached casually. Careful study of lot lines with due regard for topography, cluster grouping, for open space, and security can result in increased livability and value because of the creation of more usable sites for houses. If lots are longer, there is more flexibility in house location; therefore the lot can be more irregular. Good lotting becomes very important in small lot development. Goals to reach in lot layout, as determined by lot line location, should include:

- A favorable site for placing the house that does not require excessive grading, footings, or foundation walls. The question a developer should always ask: Does the lot contain a good house site?
- Usable area for outdoor living, such as a front and rear yard, lawn area, space for a garden, and other open space.
- Adequate surface drainage away from the house site, with slopes generally toward the street or the rear. A reasonable grade for garage and driveway approaches from the street is also important.
- Minimum on-lot grading, and the retention of specimen trees beyond the house site.
- Minimum number of common adjoining lots—ideally only three.

Corner lots should be from 10 to 20 per cent wider than interior lots in order to permit adequate yard space on the side street.





4-44 Methods of subdividing on a heavily traveled street: 1. Backing lots onto a street. 2. Using an access road. 3. Using a cul-de-sac opening off the collector. 4. Using a loop street. 5. Backing a cul-de-sac onto a collector.

**Appendix III**

**Site Development Alternatives.**

Source: NAHB, Cost effective site planning, 1976.

A statistical summary and comparison of a twenty-five alternative plans ranging from one to four acres (1 acre=4dunums) in size and from 2.75 to 9.55 dwelling units per acre in density. This was used as a guideline to compare conventional and cluster plans for a 166 acre site in terms of site costs and land utilization.

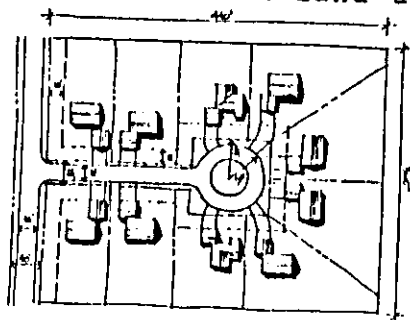
**SUMMARY COMPARISONS**

**PUBLIC CUL-DE-SACS  
COST COMPARISONS —  
SINGLE FAMILY/DETACHED**

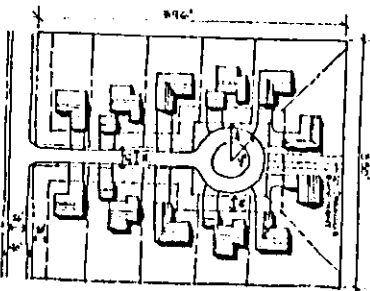
	2.75	4	Typical Standards 4	Zero Lot Line 5
Clearing and Grubbing	\$ 452	\$ 350	\$ 381	\$ 330
Grading Streets	332	276	392	257
Street Pavement	593	498	731	459
Storm Drainage	854	611	619	583
Sanitary Sower	943	827	923	801
Water Distribution	552	468	531	447
Curbs and Gutter	679	701	679	657
Driveways	760	700	700	500
Sidewalks	272	208	212	188
Street Trees	368	308	308	204
Grading/Seeding	1,157	741	768	523
<b>Totals</b>	<b>\$6,960</b>	<b>\$5,686</b>	<b>\$6,242</b>	<b>\$5,039</b>
% of 4 DU/AC	112%	91%	100%	81%

**QUANTITY/SIZE COMPARISONS —  
SINGLE FAMILY/DETACHED**

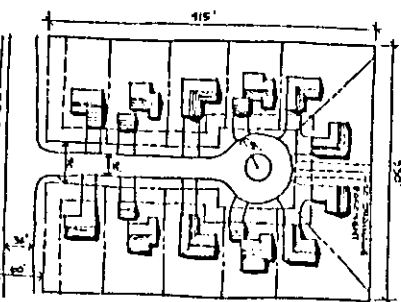
	2.75	4	Typical Standards 4	Zero Lot Line 5
S.F./Unit	2,500	2,000	2,000	2,000
Avg. Lot Size/S.F.	14,363	9,611	9,675	7,390
Off-Street Parking	4	4	4	2+
Minor Street Width	20'	20'	30'	20'
Minor Street R.O.W.	28'	28'	50'	28'
Street Pavement/DU	1,268	1,066	1,566	986
I.F. Street/DU	61	51	51	49
Curbs and Gutters/DU	93	96	93	90



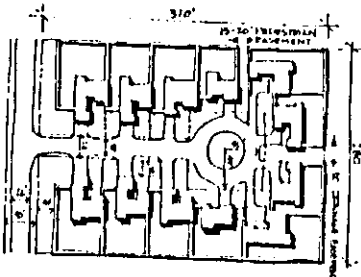
2.75 Net Density



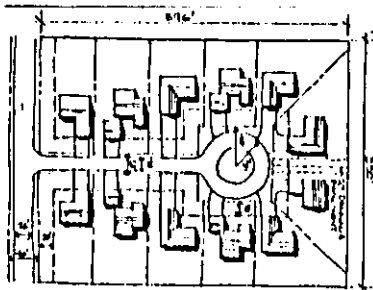
4.0 Net Density



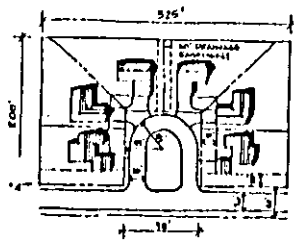
4.0 Typical Standards Net Density



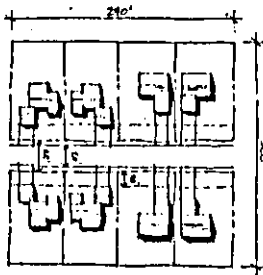
5.0 Zero Lot Line Net Density



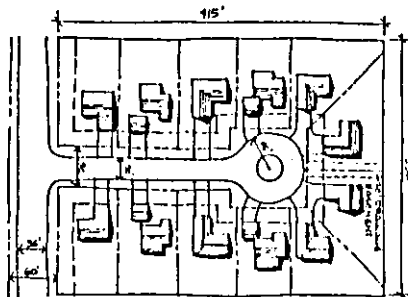
Public Cul-de-sac



Public Eye Brow



Public Street



Typical Standards  
Cul-de-sac

## SUMMARY COMPARISONS

### PLAN EFFICIENCY

### COST COMPARISONS OF 4 DU/AC PLANS

	Public Cul-de-sac	Public Eye Brow	Public Street	Typical Standards Cul-de-sac
Cleaning and				
Grubbing	\$ 350	\$ 373	\$ 339	\$ 301
Grading Streets	276	416	226	392
Street Pavement	490	787	453	731
Storm Drainage	011	097	703	619
Sanitary Sewer	027	059	749	023
Water Distribution	468	558	414	531
Curbs and Gutter	701	861	533	679
Driveways	700	060	050	700
Sidewalks	208	200	272	212
Street Trees	300	390	208	300
Grading/Seeding	741	733	706	768
<b>Totals</b>	<b>\$5,686</b>	<b>\$7,002</b>	<b>\$5,413</b>	<b>\$6,242</b>
% of Typical Standards Cul-de-sac	81%	112%	87%	100%

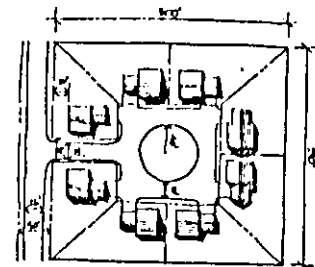
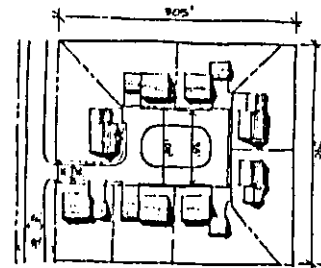
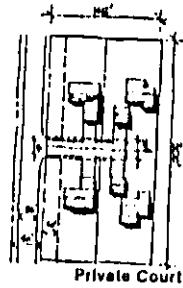
### QUANTITY/SIZE COMPARISONS OF 4 DU/AC PLANS

	Public Cul-de-sac	Public Eye Brow	Public Street	Typical Standards Cul-de-sac
S.F./Unit	2,000	2,000	2,000	2,000
Avg. Lot Size/S.F.	0,611	0,290	0,425	0,875
Off-Street Parking	4	4	4	4
Minor Street Width	20'	20'	26'*	30'
Minor Street R.O.W.	28'	28'	40'*	50'
Street Pavement/DU	1,066	1,672	943	1,566
L.F. Street/DU	51	65	36	51
Curbs and Gutter/DU	96	118	73	93

\* Subcollector Street Dimensions

**COST COMPARISONS OF 4 DU/AC PLANS**

	Private Court	Commons Court	Auto Court
Clearing and Grubbing	\$ 300	\$ 300	\$ 301
Grading Streets	320	427	468
Street Pavement	696	756	875
Storm Drainage	766	800	808
Sanitary Sewer	1,133	963	991
Water Distribution	702	564	579
Curbs and Gutter	511	1,095	861
Driveways	440	500	500
Sidewalks	300	144	144
Street Trees	152	144	144
Grading/Seeding	860	751	687
<b>Totals</b>	<b>\$8,272</b>	<b>\$8,520</b>	<b>\$8,418</b>
% of Typical Standards Cul-de-sac	100%	104%	103%



**QUANTITY/SIZE COMPARISONS OF 4 DU/AC PLANS**

	Private Court	Commons Court	Auto Court
S.F./Unit	2,000	2,100	2,100
Avg. Lot Size/S.F.	10,875	9,114	844
Off-Street Parking	4	4	4
Minor Street Width	18'	20'	20'
Minor Street R.O.W.	20'	00'	130'
Street Pavement/DU	1,470	1,622	1,001
L.F. Street/DU	30	76	81
Curb and Gutter/DU	70	150	118

## CUL-DE-SAC vs. THE COURT

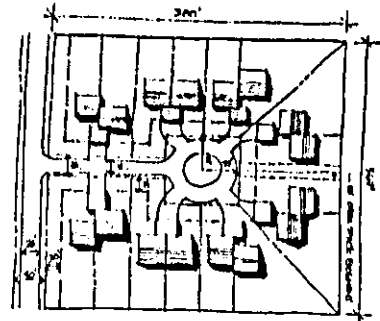
### COST COMPARISONS OF PLANS

	Duplex Plans		
	5/Cul-de-sac	7.25/Cul-de-sac	6.8/Private Court
Cleaning and			
Grubbing	\$ 332	\$ 253	\$ 240
Grading Streets	198	160	216
Street Pavement	356	287	413
Storm Drainage	471	426	449
Sanitary Sewer	711	633	761
*Water Distribution	375	321	444
urbs and Gutter	496	402	627
Driveways	370	370	250
Sidewalks	158	120	180
Street Trees	216	180	188
Grading/Seeding	694	331	371
<b>Totals</b>	<b>\$4,275</b>	<b>\$3,433</b>	<b>\$4,178</b>

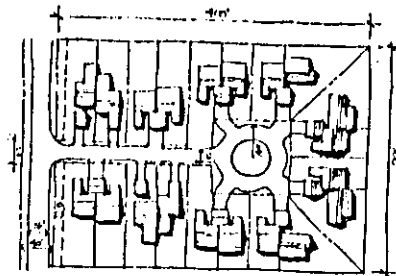
### QUANTITY/SIZE COMPARISONS OF PLANS

	Duplex Plans		
	5/Cul-de-sac	7.25/Cul-de-sac	6.8/Private Court
S.F. Unit	2,450	2,200	1,800
Avg. Lot Size/S.F.	7,854	4,800	5,000
Off-Street Parking	4	21	2
Minor Street Width	20'	20'	18'
Minor Street R.O.W.	28'	28'	20'
Street Pavement/DU	761	615	809
L.F. Street/DU	36	30	47
urb and Gutter/DU	68	55	86

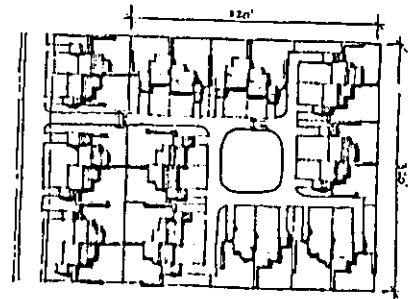
(see pages 138-141 for statistical comparisons)



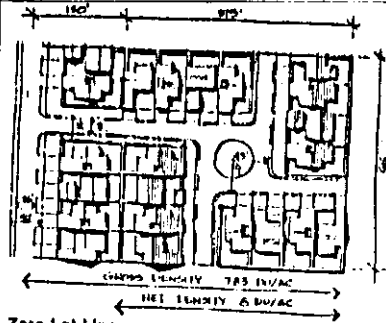
Duplex  
5/Cul-de-sac



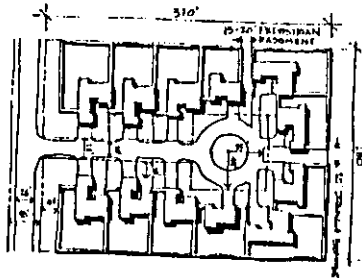
Duplex  
7.25/Cul-de-sac



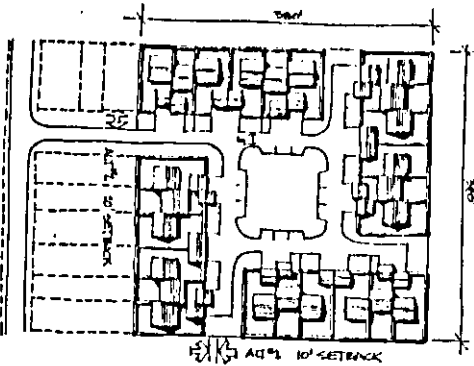
Duplex  
6.8/Private Court



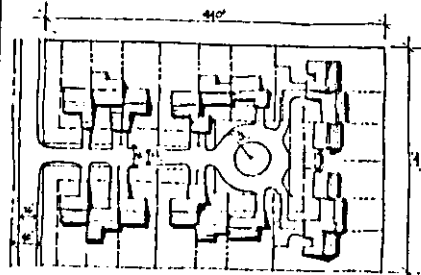
Zero Lot Line  
8/Court



Zero Lot Line  
5/Cul-de-sac



Triplex  
7.25/Court



Triplex  
6/Cul-de-sac

### SUMMARY COMPARISONS

#### CUL-DE-SAC vs. THE COURT

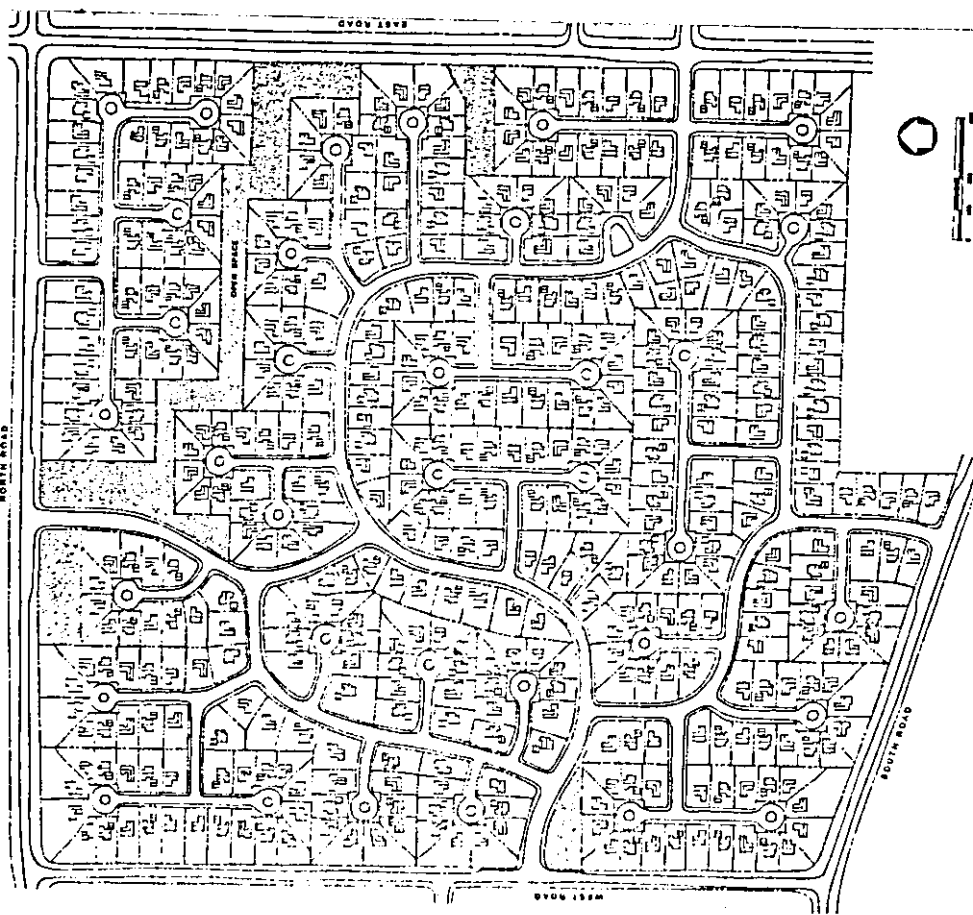
#### COST COMPARISONS OF PLANS

	Zero Lot Line		Triplex	
	8/Court	5/Cul-de-sac	7.25/Court	6/Cul-de-sac
<b>Clearing and</b>				
Grubbing	\$ 216	\$ 300	\$ 237	\$ 296
Grading Streets	197	257	204	183
Street Pavement	422	459	364	333
Storm Drainage	490	503	396	421
Sanitary Sewer	817	801	697	669
Water Distribution	417	447	381	348
Curbs and Gutter	540	657	445	460
Driveways	400	500	500	320
Sidewalks	168	188	158	144
Street Trees	168	294	158	204
Grading/Seeding	277	523	290	480
<b>Totals</b>	<b>\$4,166</b>	<b>\$5,030</b>	<b>\$3,834</b>	<b>\$3,864</b>

#### QUANTITY/SIZE COMPARISONS OF PLANS

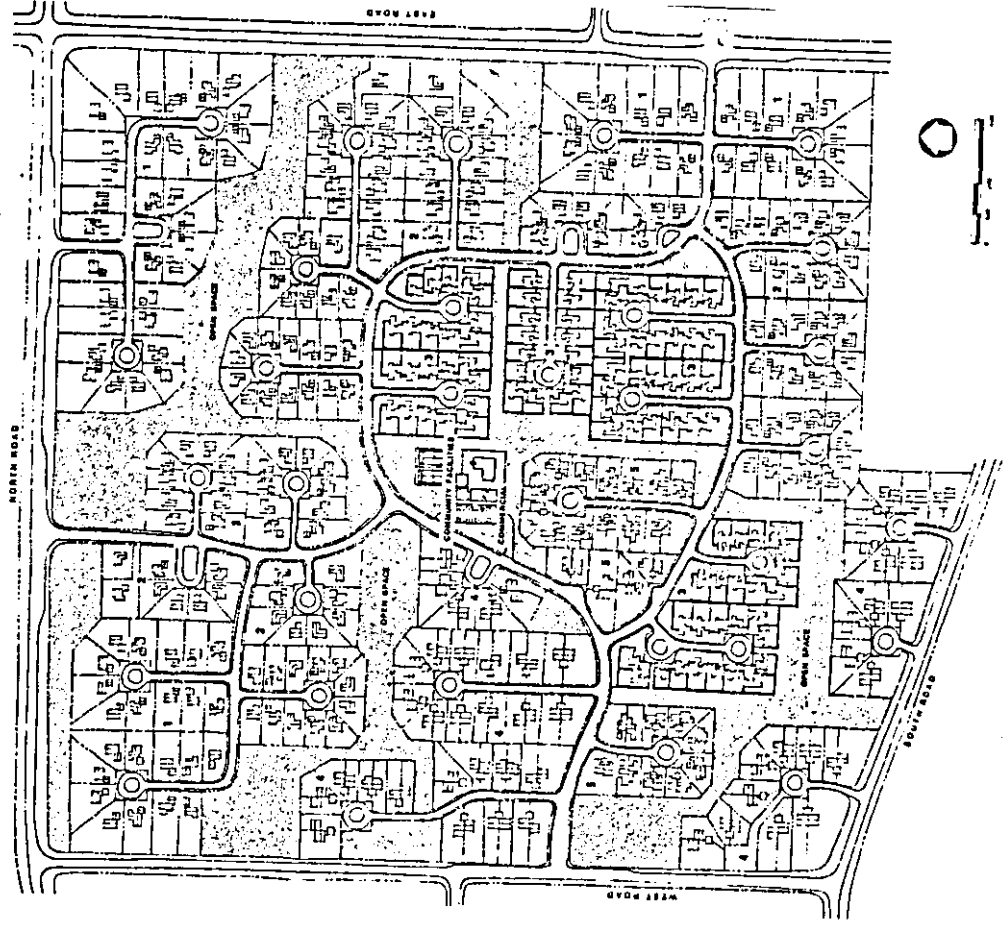
	Zero Lot Line		Triplex	
	8/Court	5/Cul-de-sac	7.25/Court	6/Cul-de-sac
S.F./Unit	1,200	2,000	1,800	1,800
Avg. Lot Size/S.F.	4,299	7,390	4,583	6,375
Off-Street Parking	3	2+	2	2
Minor Street Width	20'	20'	18	20
Minor Street R.O.W.	24'	28'	20	28
Street Pavement/DU	986	915	785	715
L.F. Street/DU	42	49	39	34
Curb and Gutter/DU	74	90	61	63





ALL DWELLING UNITS  
SINGLE FAMILY 4 DU/AC

CONVENTIONAL NEIGHBORHOOD



- 1 SINGLE FAMILY 2.75 DU/AC
- 2 SINGLE FAMILY 4.0 DU/AC
- 3 ZERO LOT LINE 5.0 DU/AC
- 4 DUPLEX 5.0 DU/AC
- 5 DUPLEX 7.25 DU/AC

CLUSTER NEIGHBORHOOD

**STATISTICAL COMPARISON OF THE  
CONVENTIONAL AND CLUSTER  
NEIGHBORHOOD PLANS**

	CONVENTIONAL	CLUSTER
Number of units	472	472
Minimum lot size	8,000 S.F.	4,000 S.F.
Residential land area	156.59 acres	131.40 acres
Commercial land area	0 acres	1.0 acres
Open Space land area	9.41 acres (6% of 166 ac.)	33.8 acres (20.2%)
Collector Street R.O.W. Included in residential land area acreage	13.14 acres (8% of 166 ac.)	7.26 acres (4%)
Total Roads	25,781 L.F.	23,415 L.F.
L.F. Road/DU	55 L.F.	50 L.F.
Total Curb/Gutter	48,208 L.F.	—
L.F. Curb/Gutter/DU	102 L.F.	—
Total Road Pavement	837,978 S.F.	525,570 S.F.
S.F. Pavement/DU	1,775 S.F.	1,113 S.F.
Total Storm Sewer	15,250 L.F.	7,040 L.F.
L.F. Storm Sewer/DU	32 L.F.	15 L.F.
Total Water	31,668 L.F.	25,599 L.F.
L.F. Water/DU	67 L.F.	54 L.F.
Total Sanitary Sewer	40,755 L.F.	33,874 L.F.
L.F. Sanitary/DU	86 L.F.	72 L.F.

(see pages 142-143 for detail cost information)

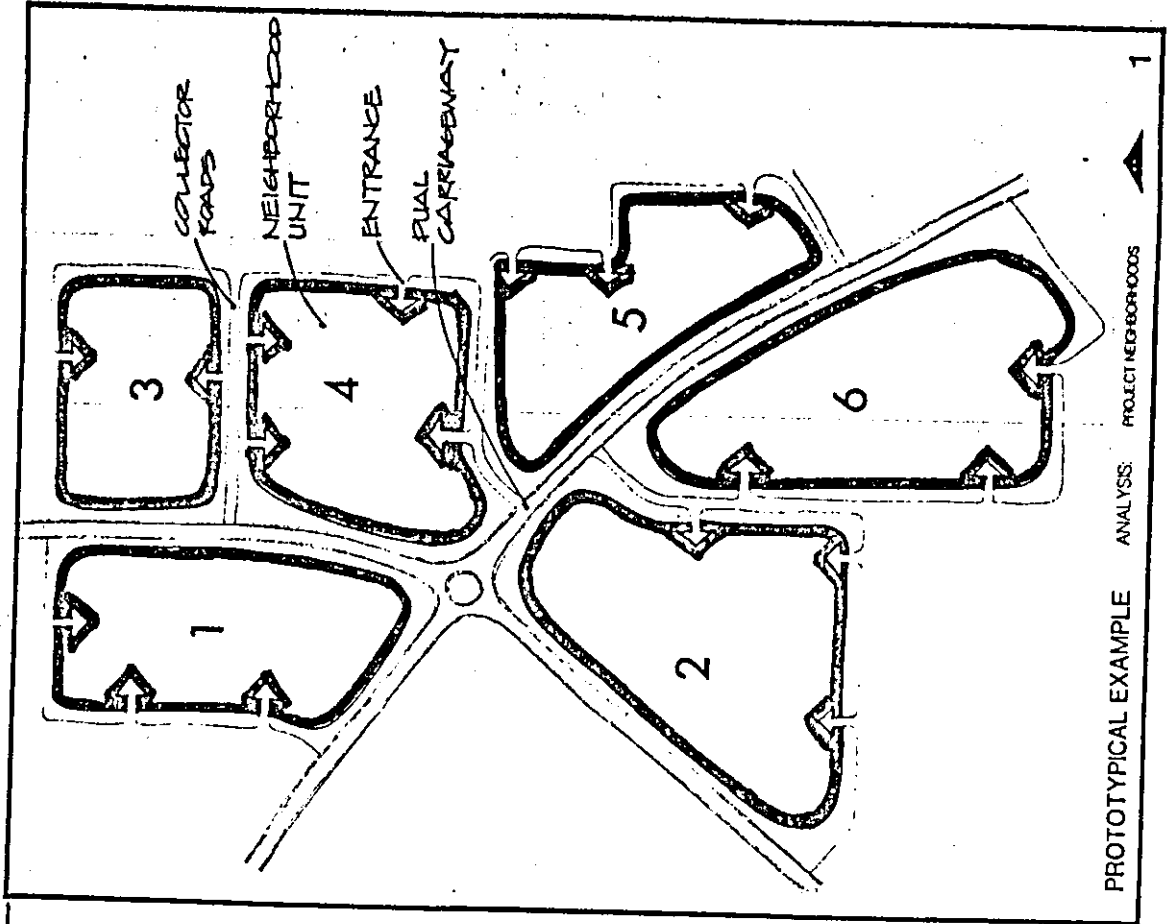
**SUMMARY OF SITE DEVELOPMENT COSTS**

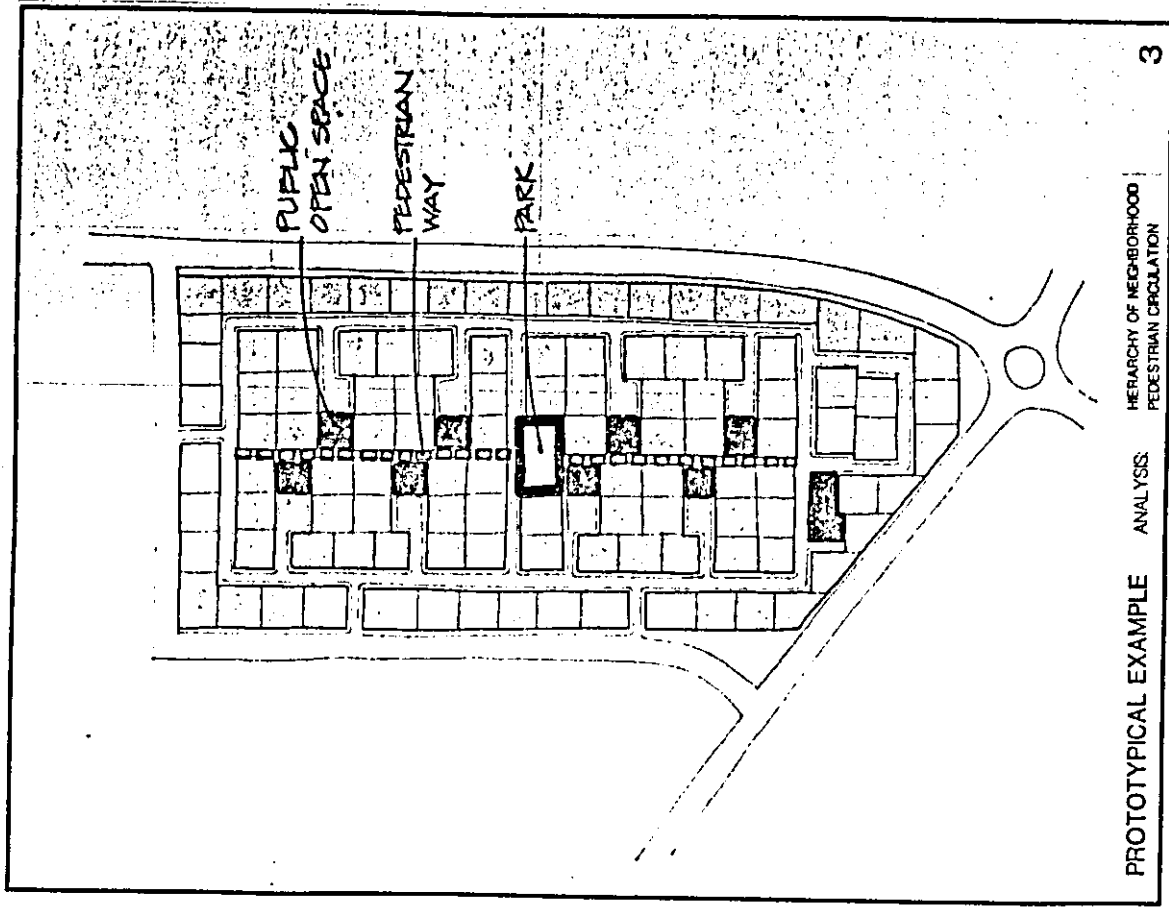
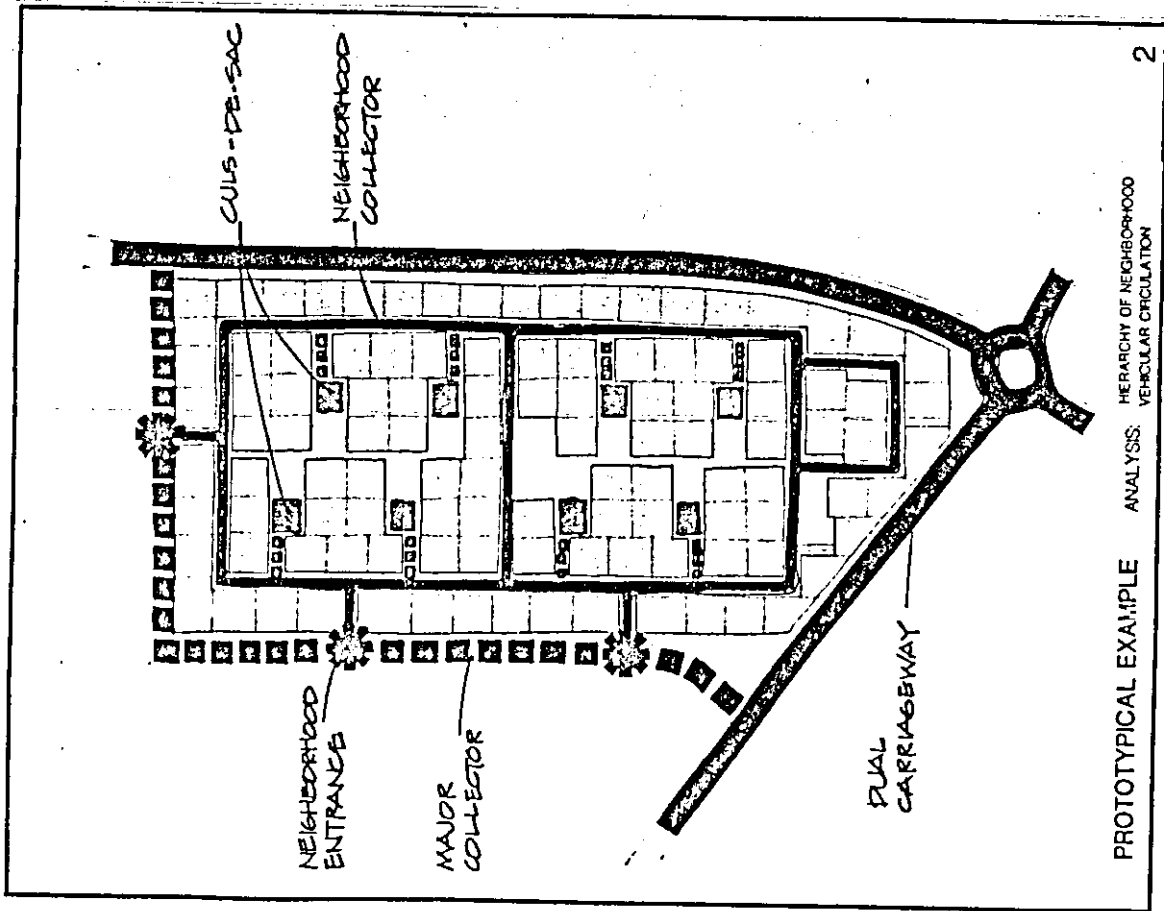
	CONVENTIONAL		CLUSTER	
	Total Costs	Costs/DU	Total Costs	Costs/DU
Street Pavement	\$ 392,379	\$ 831	\$ 246,048	\$ 521
Curbs & Gutters	\$ 351,918	\$ 746	—	—
Street Trees	\$ 206,248	\$ 437	\$ 187,320	\$ 397
Driveways	\$ 330,400	\$ 700	\$ 254,540	\$ 539
Storm Drainage	\$ 310,950	\$ 659	\$ 179,950	\$ 381
Water Distribution	\$ 293,208	\$ 621	\$ 244,694	\$ 518
Sanitary Sewer	\$ 459,462	\$ 973	\$ 403,419	\$ 855
Grading	\$ 258,986	\$ 549	\$ 167,740	\$ 355
Clearing and Grubbing	\$ 118,200	\$ 250	\$ 82,800	\$ 175
Sidewalks	\$ 124,000	\$ 263	\$ 117,200	\$ 248
Subtotal	\$2,845,751	\$6,029	\$1,883,711	\$3,991
Engineering Fees (5.6%)	\$ 159,362	\$ 338	\$ 109,255	\$ 231
<b>Total</b>	<b>\$3,005,113</b>	<b>\$6,367</b>	<b>\$1,992,966</b>	<b>\$4,222</b>
Actual difference on a per lot basis		\$2145		
% of conventional lot cost		100%		66%

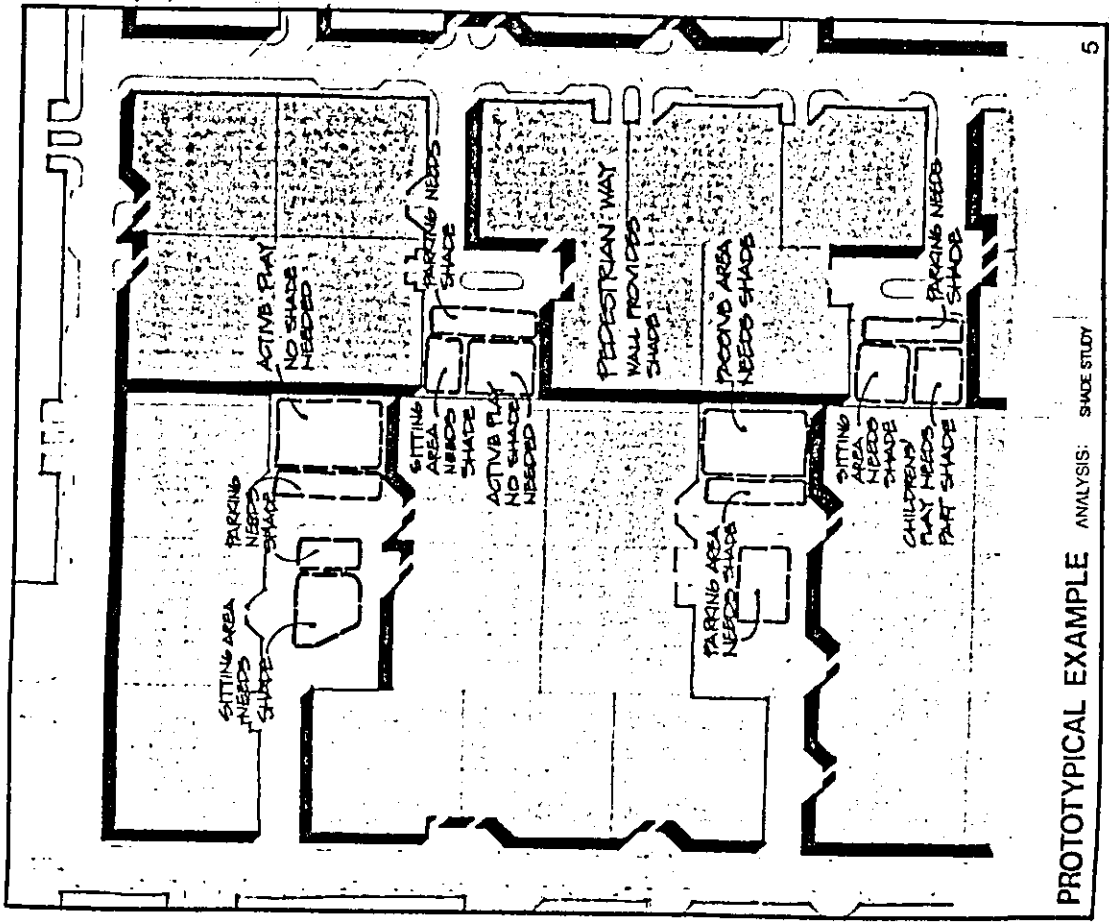
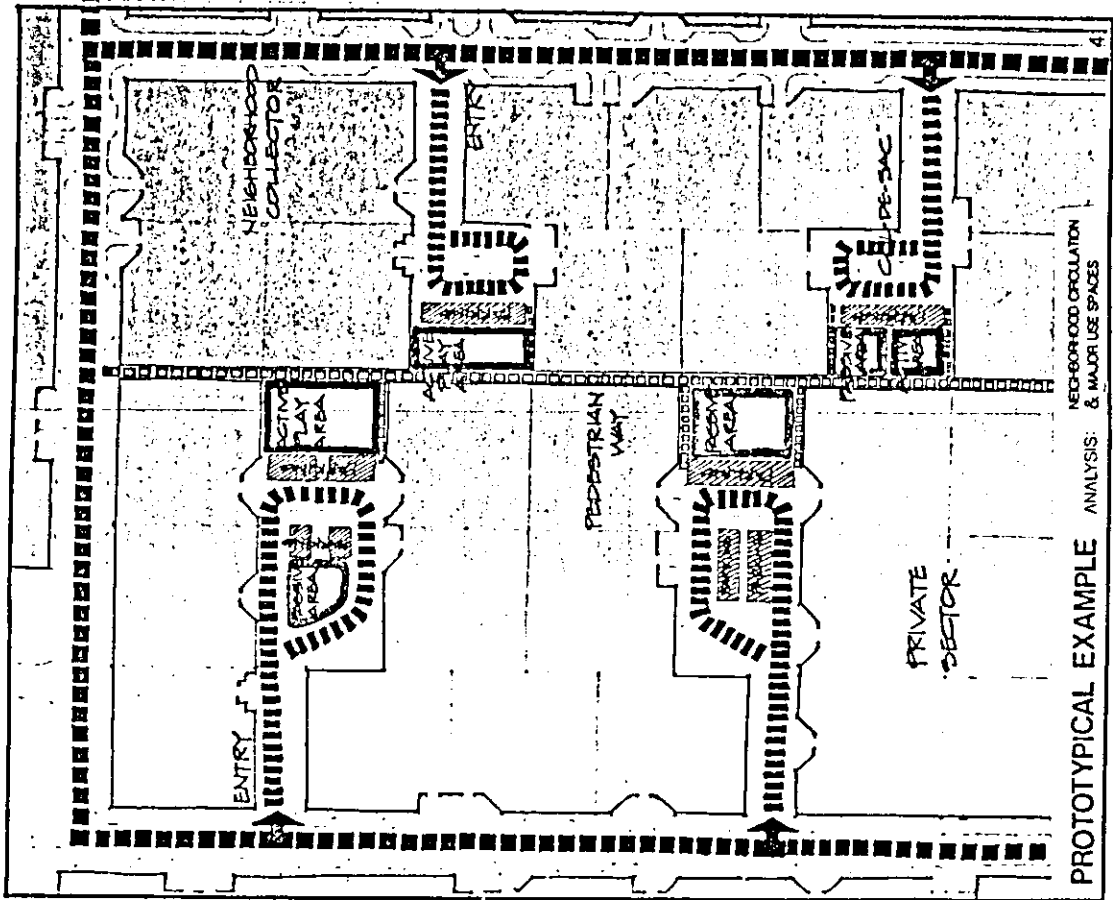
Appendix IV

Design Solutions-Prototypical Examples.

Obata and Cassabawm Engineers in Texas, illustrated graphically their approach to urban design solution for arid zone areas; analysis of project neighborhood; analysis of the hierarchy of neighbourhood vehicular circulation, neighbourhood pedestrian circulation and neighbourhood circulation of major use spaces. Beside providing design vocabulary, in terms of items both common to all neighbourhoods and special to each individual one.



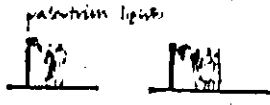




# PROJECT CONTINUITY

ITEMS COMMON TO ALL NEIGHBORHOODS

## LIGHTING



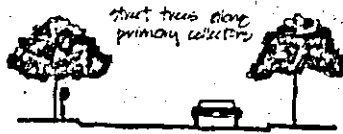
## PAVING



## VILLA GRAPHICS



## PLANTING



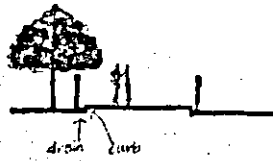
## SITE FURNITURE



## GRAPHICS



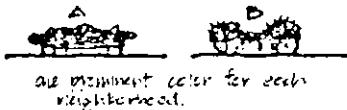
## CONSTRUCTION DETAILS



## PLANTING



change prominent trees from neighborhood to neighborhood



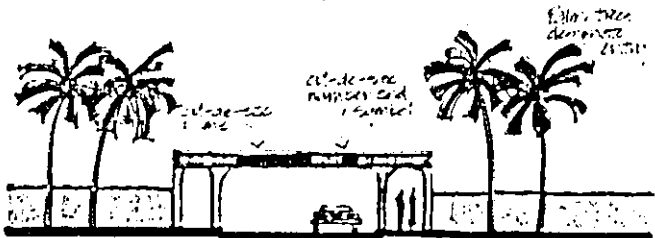
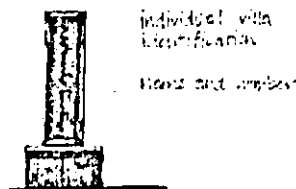
# NEIGHBORHOOD IDENTITY

ITEMS SPECIAL TO EACH NEIGHBORHOOD

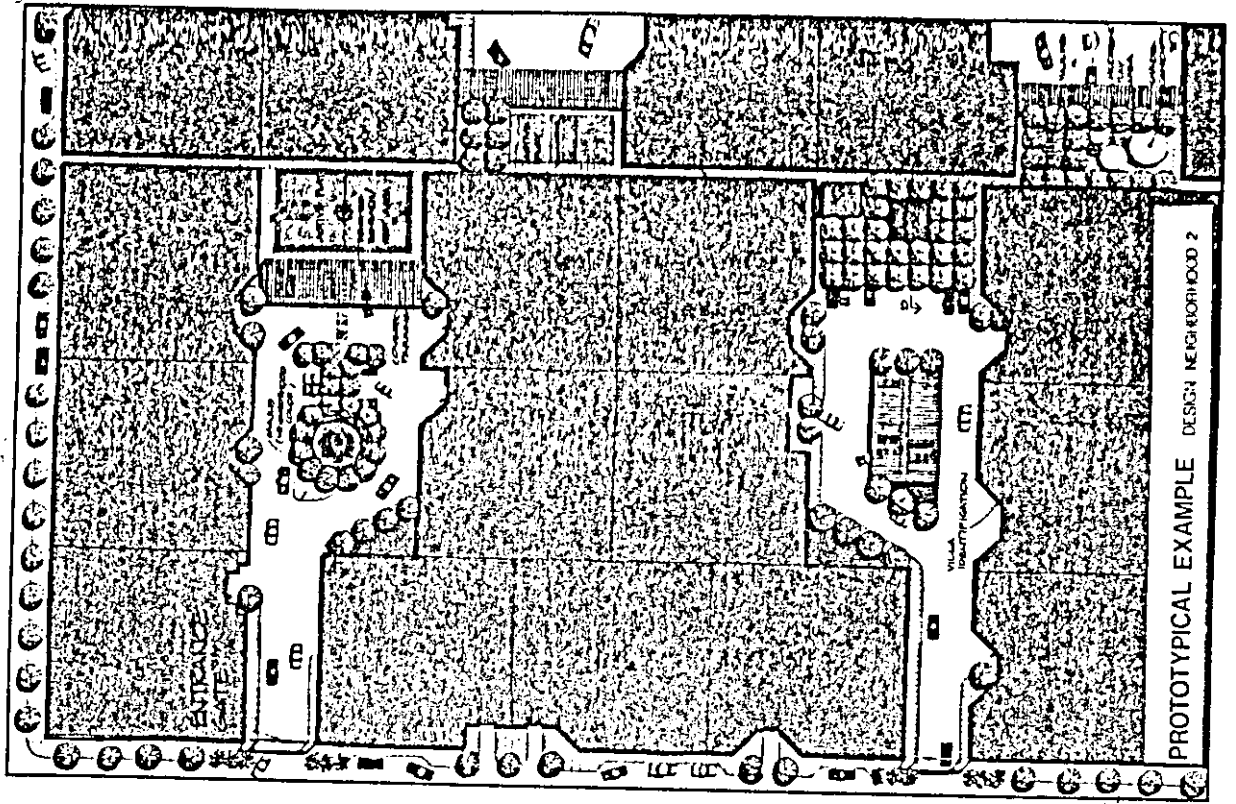
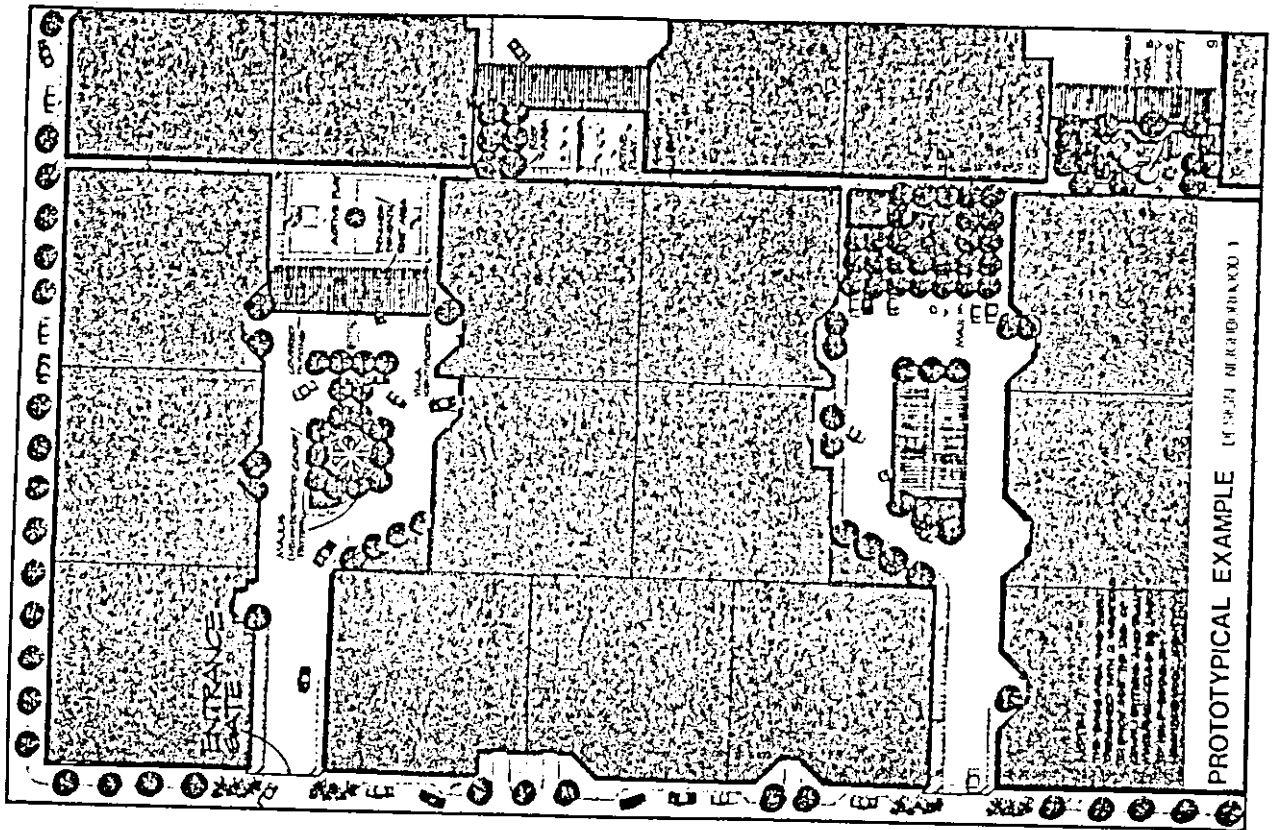
## PAVING



## GRAPHICS



## CULDESAC ENTRY



## Appendix V

A 1981 study was prepared by the Ministry of Municipal and Rural Affairs and Environment to re-adjust the current planning and building legislations.

الحد الأدنى لمساحة القطع وأبعاد مـ

٠٦

العمق م	الواجهة م	المساحة م <sup>٢</sup>	المناطق السكنية
٣٥ م	٢٥ م	١٠٠٠ م <sup>٢</sup>	منطقة المساكن الخاصة • المستقلة
٣٠ م	١٤ م	٥٠٠ م <sup>٢</sup>	منطقة المساكن الخاصة • المتصلة
٣٠ م	٢٥ م	٨٠٠ م <sup>٢</sup>	منطقة المساكن العادية
٢٥ م	٢٠ م	٦٠٠ م <sup>٢</sup>	منطقة المساكن العادية
٢٠ م	١٨ م	٤٠٠ م <sup>٢</sup>	منطقة المساكن العادية
١٣ م	١٤ م	٢٠٠ م <sup>٢</sup>	منطقة المساكن العادية
١٢ م	١٢ م	١٥٠ م <sup>٢</sup>	منطقة المساكن العادية
١٢ م	١٠ م	١٥٠ م <sup>٢</sup>	منطقة المساكن الشعبية • المتصلة

## المادة ٠١٤ المناطق السكنية

- تقسم المناطق السكنية الى مايلي:
- ٠١ المناطق السكنية الخاصة
  - ٠٢ المناطق السكنية العادية
  - ٠٣ المناطق السكنية الشعبية
- ٠١ مفة استعمال الاراضي والمباني

تستعمل الاراضي والمباني في المناطق السكنية للإبنية المخصصة للسكن على انه يمكن اقامة ابنية في المناطق السكنية للاستعمالات الاخرى حسب الاحكام الخاصة الواردة في الفصل الرابع من هذا النظام

افراز وتقسيم الاراضي:

- يتم تقسيم وافراز الاراضي في هذه المناطق حسب الشروط التالية:
- ٠١ ان لا يقل عرض الشارع عن "٣م" على انه يسمح للشوارع ذات النهايات المغلقة بان يكون عرضها "٨م" على ان يتراوح طول هذا الشارع من ٥٠ - ١٠٠ م
  - ٠٢ يشترط في الشوارع ذات النهايات المغلقة ايمال نهايتها بشوارع بافد بواسطة ممر للمشاة لا يقل عرضه عن "٤م"
  - ٠٣ ان لا يزيد طريق المشاة عن "٨م" طولاً واداً زاد عن ذلك يشترط تأمين ساحة بمساحة لا تقل عن "١٥م<sup>٢</sup>" معـ كل "٨م<sup>٢</sup>"
  - ٠٤ ان لا يقل عرض طريق المشاة الذي يخدم قطعه واحده عن "٣م" وان يزيد هذا العرض بمعدل "١م" لكل قطعه اخرى
  - ٠٥ ان لا يقل عرض الادراج عن "٣م"



المادة ١٥٠ المباني العاليه السكنيه

يسمح بإقامة الابنية العاليه حسب الاحكام المحدد لها بهذه  
الماده بمختلف المناطق السكنيه ماعدا المدايقه السكنيه الخاصه ،  
سواء حددت لها مناطق خاصه على المخططات اولم تحدد .  
صفا استعمال المباني العاليه

أ .  
تشتمل هذه المباني للخايات السكنيه  
ب .  
احكام الافراز والبناء للأبنيه العاليه السكنيه

الحد الادنى للمساحه : ٢٢٠٠٠ م<sup>٢</sup>  
الحد الادنى لعرض الواجهه : ٤٠ م  
الحد الادنى للعمق : ٤٠ م  
الحد الادنى للارتدادات : ١٠ م ، خلفي ٨ م

جانبى ٨ م على ان يتم  
توفير هذه الارتدادات  
ابتداء من الطابق الارضى  
: سطحه ٤٠ %  
: ٨ طوابق ، ٢٩ متر  
: شقق سكنيه للطوابق العنكره  
الاستعمالات المسموح بها :  
وسمح بالطابق الارضى للاستعمالات التجاريه ذات صفا التخديسه  
اليوميه بنسبه لا تزيد عن ١٠ % من مساحه الطابق الارضى .

ج .  
الشروط الخاصه

- تقام هذه المجمعات في كافة المناطق ماعدا المناطق السكنيه  
للخاصه .
- ان لا يقل عرض الشارع عن " ٢٠ م " او شارع تحديسي
- توفير وسائل الاتصال ( الضماد ) حسب المعايير المطلوبه .
- ان يرخص وينفذ البناء كاملا دون تجزئه .
- توفير مواقف للسيارات اللازمه حسب الشروط المطلوبه ولا يستعان  
عليا بالبدال المالى .
- توفير وسائل السلامه العامه .

ج . احكام البناء :

تحدد احكام البناء في المناطق السكنيه كالآتى

الحد الاعلى للنبناء وعدد الطوابق والارتفاع العنقر	الحد الاعلى للنبله		الارتفاع	الامسى	خلفي	جانبى	المواد السكنيه
	الطوابق	الارتفاع					
٢	٢	٨٠	٦	٧	٥	٥	الساكن الخاصه المستقله
٢	٢	٨٠	٦	٧	٥	-	الساكن الخاصه المتصله
٤	٤	١٤٠	٤	٥	٤	٤	مطابقه سكن "أ"
٤	٤	١٤٠	٤	٤	٤	٣	مطابقه سكن "ب"
٤	٤	١٤٠	٤	٣	٢	٢	مطابقه سكن "ج"
٣	٣	١١٠	٣	٣	٢	٢	مطابقه سكن "د"
٣	٣	١١٠	٣	٣	٢	٢	مطابقه سكن "هـ"
٣	٣	١١٠	٣	٣	٢	-	الساكن الشعبيه المتصله

377973

ABSTRACT IN ARABIC

ملخص باللغة العربية